

**UNDER THE COMMISSIONS OF INQUIRY ACT 1908**

**IN THE MATTER OF ROYAL COMMISSION OF INQUIRY INTO BUILDING  
FAILURE CAUSED BY CANTERBURY EARTHQUAKES**

**KOMIHANA A TE KARAUNA HEI TIROTIRO I NGĀ  
WHARE I HORO I NGĀ RŪWHENUA O WAITAHA**

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**ADDITIONAL SUBMISSIONS ON THE LEGAL REQUIREMENTS FOR EARTHQUAKE  
PRONE BUILDINGS AND RELATED MATTERS (ISSUES 3(b) TO 3(d))**

**DUE DATE: 20 FEBRUARY 2012**

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## 1. Introduction

1.1. These submissions are made by the Christchurch City Council (**the Council**) and address issues dealt with by the Royal Commission at the hearings during the weeks of 7 and 14 November 2011. At those hearings the Royal Commission agreed that the Council could provide additional submissions on policy matters that the full Council was still to consider (see the transcript for the hearing on 14 November 2011 at TRANS.20111114.80). A due date for the Council's additional submission was set as 20 February 2012.

1.2. The following matters are dealt with in this submission:

1.2.1. Which buildings should be treated by law as earthquake-prone, and what standard should be reached for the seismic strengthening of those buildings, and over what period.

1.2.2. Whether, to what extent and over what period should buildings that are not earthquake-prone be required to meet new building standards.

1.2.3. The desirability of immediate action in respect of restraining parapets, chimneys, and other high-hazard elements.

1.2.4. The respective roles of central and local government in respect of earthquake-prone buildings and their seismic strengthening.

1.3. The Council's earlier submission (ENG.CCC.006.SUB) also partly addresses these issues. This submission represents the formal Council view on these matters.

**2. Which buildings should be treated as earthquake-prone under s122 of the Building Act 2004, and what standard should they be strengthened to and over what period (Issue 3(b))**

***The buildings that are, and those that should be, treated by the law as "earthquake prone"***

- 2.1. A building that is earthquake-prone under s122 of the Building Act 2004 is currently one with a seismic performance strength that is less than 33% of the design standards (the one-third rule) for a new building that would be built on the same site. The current definition covers all buildings not just unreinforced masonry buildings. The buildings that can be considered earthquake-prone must also be commercial buildings or residential buildings of 2 storeys or more containing 3 or more household units.
- 2.2. The Council submits that this test should stay the same for the next 5 years while the Canterbury Earthquake Recovery Act 2011 is in force and the Canterbury Earthquake Recovery Authority (CERA) exercises powers under that Act.
- 2.3. In the Canterbury region the seismic loading factor changed in May 2011 and more buildings will now be classed as earthquake-prone without any change to the 33% test. For example a building that had a strength of 34% in 2009 that is undamaged and in exactly the same condition in 2012 as in 2009, is estimated to have a strength of 25% of the 2012 code requirements.
- 2.4. The involvement of CERA in relation to action being taken in respect of earthquake-prone buildings in the city is also relevant. Under their Act they have devised a process for requiring certain building owners to complete detailed engineering evaluations of buildings and where necessary any building with a strength under 33%, will need to have its strength brought above that level.
- 2.5. In the long term the Council submits the test should be increased. The Royal Commission is best placed to recommend an appropriate increase to

the test once it has reviewed all the information presented to it on the performance of buildings, and having considered other relevant factors, including the economic, social and environmental impacts of any increase.

***To what standard should earthquake-prone buildings be strengthened***

- 2.6. As noted in the Council's earlier submission, there is a lack of clarity in the current legislation as to what level of strengthening a Council can require for a building and what level it can enforce when issuing a section 124(1)(c) notice. There is also no direct means for Councils to enforce their earthquake-prone buildings policies.
- 2.7. The Council submits that building owners should be directly required through legislation to strengthen their buildings and that Councils should simply have power to enforce any inaction by owners.
- 2.8. In relation to an appropriate strengthening level, the Royal Commission can note that the Council's Earthquake-prone Buildings Policy sets a target for owners of earthquake-prone buildings to strengthen their buildings to 67%. Council works at persuading owners to achieve this level. However, it has encountered significant resistance from insurers to pay for any strengthening of earthquake damaged buildings, other than that required to lift a building above 33%. Most building owners do not have sufficient funds themselves to pay to get the building to a higher level. In the future however, insurance might not even cover strengthening of buildings to any level.
- 2.9. If the level at which a building is considered earthquake-prone was to be increased to 67% of code then clearly any strengthening would need to bring a building above that level (unless a higher level for building strengthening was set).
- 2.10. However, if the 33% test remains then the Council submits the standard to which an earthquake-prone building should be strengthened is something that the Royal Commission is best placed to determine. When it has received all the information on the performance during the earthquakes of the various sample buildings it has selected it will be able to weigh up which

strength buildings performed the best in terms of life safety (and also protection of the building).

- 2.11. It may be appropriate to set a different strengthening level for different parts of New Zealand, determined against the different earthquake hazard zones, which have already been set through the seismic loading standard.
- 2.12. The Royal Commission should also consider this issue holistically, taking into account the insurance issues, costs of strengthening different types of earthquake-prone building, and the environmental and amenity impact of any recommendations it makes. (For example, if the strengthening level is too high and, as a result, is too expensive for building owners there is a risk that a larger number of buildings will be demolished, including character and heritage buildings.)

***What period should be allowed for the strengthening of earthquake-prone buildings***

- 2.13. The report entitled "*The Performance of Unreinforced Masonry Buildings in the 2010-2011 Canterbury Earthquake Swarm*" by Associate Professor Jason Ingham and Professor Michael Griffith: ENG.ACA.001F (the URM Report) in section 7 (at page 114) states that "*recommendation 4 should be a national requirement*".
- 2.14. Recommendation 4 relates to the authors' proposal that all URM buildings should "*as soon as possible*" go through the first two stages set out in the report in relation to building improvements<sup>1</sup>. The URM Report does not make any recommendations regarding periods for compliance, except to the extent it suggests that stages 1 and 2 should be implemented "*as soon as possible for all URM buildings*".
- 2.15. The Council submits that having four stages is too complicated and these should be reduced to two stages. Further discussion of these issues is set

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<sup>1</sup> The four stages are: 1: Eliminate falling hazards 2: Strengthen masonry walls to prevent out-of-plane failures 3: Ensure adequate connection between all structural elements of the building 4: Additional steps, if further capacity is required to survive earthquake loading.

out below in the Council's submission related to the desirability of immediate action.

2.16. The Council's earthquake-prone buildings policy currently provides timeframes of between 15-30 years, which will commence on 1 July 2012, within which earthquake-prone buildings must be strengthened. Other councils provide for different periods of compliance, and there is no set time frame by which all earthquake-prone buildings in New Zealand will be upgraded.

2.17. Councils are required to listen to submitters on their policy through the special consultative procedure. Building owners generally place pressure on Councils to provide long time frames for strengthening because they consider the compliance costs for them to strengthen buildings any sooner is unreasonable. The number of submitters who want buildings strengthened sooner (and/or to a higher level) are usually in the minority.

2.18. The Council submits that the decision on the appropriate maximum timeframes for strengthening of earthquake-prone buildings should be made by Central Government with provision made for Councils, in consultation with their communities, to be able to reduce those timeframes but not extend them. In addition there should be shorter timeframes that apply in respect of a building that, if it collapsed, could affect other buildings in its vicinity.

### **3. Whether, to what extent and over what period should buildings that are not earthquake-prone be required to meet current requirements (Part of Issue 3(c))**

3.1. As discussed in Council's earlier submission, there is no *general* legal requirement in the Building Act 2004, or elsewhere, for a building owner to upgrade a building to current building standards.<sup>2</sup> The situations when a Council can require some upgrading were also set out in that submission.

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<sup>2</sup> There is also no requirement on an owner to regularly maintain their buildings, unless there are specified systems in the building that require an annual building warrant of fitness (see sections 100-111 of the Building Act 2004).

- 3.2. The Council submits that this matter should not be considered in isolation from other possible related reforms. It would be a significant additional cost for most residential building owners to be required to strengthen their buildings. In general, residential buildings tend to be lower risk buildings (as recognised by the proposed new consents provisions in the Building Amendment Bill no 3).
- 3.3. However, Council has reached the view that all non-residential buildings, and residential buildings that comprise 2 or more storeys and contain 3 or more household units, should be required to undergo a regular structural survey, every 20 years for the first 20 years after their construction and then every 10 years for a building older than 40 years. This would align with the minimum 50 year life for a building.
- 3.4. Linked to a requirement for structural surveys should be a “star rating” system for buildings. The New Zealand Society of Earthquake Engineering is promoting a “Quake Star” project, which is a concept under development in California. It would provide the public, users of a building, insurers, banks, and other interested parties with a better idea of how safe a building is in an earthquake. It is suggested that a “star” system for the earthquake strength of buildings would provide an additional incentive for owners to strengthen their buildings.
- 3.5. If a structural survey/star rating showed that a building had a reduced structural strength, then even if the reduced strength was not such that the building would be earthquake-prone, the Council submits that provisions should be included in the Building Act to allow the Council to require strengthening.
- 3.6. The Act should be amended so that immediately following a survey that shows a building has a strength below a certain level (to be determined by the Royal Commission), the owner is required to strengthen their building to an appropriate level (also to be determined by the Royal Commission). The owner must make an application for a building consent for the work to the relevant Council. Section 112 of the Building Act would also apply to any



work on a building, resulting in upgrading of elements of the building related to means of escape from fire and disabled access and facilities.

***Additional Issue raised by Council***

3.7. The Council submits that better public information is required in relation to the standards of buildings and the appropriate response for building users in an earthquake or other emergency in that building. Guidance should be provided by the Department of Building and Housing to ensure all building owners and tenants are made aware of their responsibilities. If a “Quake Star” system is introduced then this guidance material could be provided as part of that system.

**4. The desirability of immediate action in respect of restraining parapets, chimneys, and other high-hazard elements (Royal Commission email: 8/9/11)**

4.1. The Council agrees that immediate action should be taken regarding hazardous building elements, with the owner having the choice as to whether the elements will be removed or strengthened for both heritage and non-heritage buildings, but with a preference for strengthening of heritage building elements rather than their removal. An important factor for the Council, as noted in the earlier submission, is the potential impact of legislative changes in relation to the preservation of heritage and amenity.

4.2. However, in respect of gable ends the Council submits that they must be considered against the building as a whole and, if strengthened, this should be to the same strength as the building. There is no benefit in strengthening such elements to a higher standard than the remainder of the building, but there could be an increased cost in doing so. Council considers that the strengthening of other elements, however, should be to the highest standard that is reasonably practicable.

4.3. This “immediate action” work should begin as soon as possible but it must be recognised that there may be resourcing and other issues that mean this process, if carried out throughout New Zealand, would take some time. However, an “end” date for the process should be provided. There needs to



be some prioritisation based on the risk profile and public safety issues presented by different buildings. There may also be a need to prioritise falling hazards on URM buildings ahead of other earthquake-prone buildings.

- 4.4. There will need to be clear legal powers for the Council (or another body) to be able to enforce this “immediate action” recommendation. This recommendation involves strengthening of parts of buildings. However, the current definition of “building” in the Building Act 2004 does not include “part” of a building (which is different than in the Building Act 1991). The Council is aware that the Department of Building and Housing is currently considering this issue, and amendments to the Building Act for the purposes of Council’s using dangerous earthquake-prone and insanitary powers in respect of part of a building may be made.
- 4.5. These amendments will need to be made carefully, as there could be a problem if in strengthening part of an earthquake-prone building, the whole building is brought above the earthquake-prone building threshold. For example, a building may be at 25% NBS and tying the diaphragms into the walls may bring the building up to 35% NBS. At that stage there would no longer be an earthquake-prone building and the Council may not be able to require/enforce further work. This issue has been brought to the attention of the Department of Building and Housing.

## **5. Respective roles of Central and Local Government (Issue 3(d) - in part)**

- 5.1. The Council considers that much of the current earthquake-prone building policy provisions should be determined at a national level. There should be clear direction to building owners from central government, covering more than the steps to be taken regarding immediate action on buildings.
- 5.2. As previously noted, national direction should be given on the earthquake-prone building test, strengthening levels for earthquake-prone buildings (and non-earthquake prone buildings, following a structural survey), a clear ability to enforce strengthening of buildings (with a preference that this be a

direct requirement on building owners), and the timeframes for strengthening of different buildings.

- 5.3. Some involvement of the Council and its community (local decision-making) should remain on issues related to earthquake-prone buildings, but more limited as to whether requirements set at a national level should be “exceeded” in the Council’s district. For example, as noted in paragraph 2.16 above, a Council could consult with its community on whether maximum timeframes for strengthening set nationally should be reduced, as a result of seismic activity, or potential seismic activity, affecting that Council’s district. In many communities there may now be an appetite for action to be taken more quickly.
- 5.4. In relation to whether the Building Act powers in relation to earthquake prone buildings should be made subject to the requirements of other legislation (ie the Resource Management Act 1991), the Council has two primary submissions.
- 5.5. The Orders in Council that were made following the September and February earthquakes, allowing the Council to issue warrants and demolish buildings that were an immediate danger without first obtaining a resource consent, should be included as a “standard” provision in the Building Act 2004, applicable to any emergency. It is a very high test to meet for a building to be classed as an “immediate danger” so this power could not be used lightly.
- 5.6. In addition, there is a need for a streamlined, non-notified, resource consent process for the demolition of dangerous buildings, in the months (or years) following an emergency event, that otherwise need resource consent before they can be demolished. There should be provision made for certain parties to make submissions where relevant on a demolition proposal (for example, the Historic Places Trust), but the process should not require notification.



20 February 2012

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Peter Mitchell

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Date

General Manager  
Regulation and Democracy Services  
Christchurch City Council

