

Submission by Wellington City Council to Royal Commission of Inquiry into Building Failures Caused by the Canterbury Earthquakes

“Issue 3 - Legal and best practice requirements”

**“Issue 4 – Change of New Zealand Design Standards/
Codes of Practice over time”**

“Issue 6 – Future measures”

INTRODUCTION

Wellington City Council (the Council) welcomes the opportunity to make submissions to the Royal Commission of Inquiry into Building Failures Caused by the Canterbury Earthquakes (the Royal Commission).

The Wellington region has long been recognised as an area of high earthquake risk. The region has the highest seismic performance standards for buildings in New Zealand. In addition, since the 1970s successive councils of Wellington city have proactively addressed the earthquake risks posed to and from buildings.

A buildings safety policy for Wellington city was adopted in 1990s under the 1991 Building Act. Under that Policy many buildings were strengthened to either two thirds of 1965 code for normal buildings or 100 percent of the 1965 code for heritage buildings. For Wellington 100 percent of the 1965 code is somewhere between 25 and 35 percent of the current building code. Consequently, Wellington has a number of buildings that have previously been strengthened that now require further work.

In addition to strengthening, many buildings were removed especially during the 1970s to 1990s as the result of the Council’s continued proactive approach to addressing risk to public safety from buildings in earthquakes. Since then heritage values have become more a significant consideration for the city, though demolition of some high-risk buildings continues.

The Council continues to implement a proactive response to earthquake prone buildings (EQPBs) under its 2009 EQPB Policy. As of September 2011 the Council had undertaken initial assessments on 2991 buildings, of which:

- 666 are currently identified as potentially earthquake prone
- 207 are confirmed as earthquake prone (as defined under the Building Act 2004 – the Act)
- 2118 have been found to be unlikely to be earthquake prone.

1300 buildings have yet to have an initial assessment. The Council estimates that eventually 700-800 buildings in Wellington City may be identified as earthquake prone.

The role of Councils in addressing buildings and earthquake risk extends well beyond their legal powers and obligations under relevant building legislation.

Councils have a wide range of interventions they may employ to achieve outcomes for their communities. For example Councils may establish policies and regulations under their District Plans, which may either facilitate or impede remediation of earthquake risk in the built environment. Councils can also: provide information to their communities; establish partnerships and undertake project management; create and/or provide financial incentives; provide leadership; and undertake research.

In February 2011 the Council's Strategy and Policy Committee requested that Council officers undertake "*a review – in light of the Canterbury earthquake (February 2011) and Government responses – of the effectiveness of Council's current earthquake prone buildings approach and other relevant policies and implementation measures*" (the Council's review).

On 15 September 2011 the Strategy and Policy Committee considered advice from officers on the objectives, outputs, issues and timelines and that will determine the scope of the Council's review. This advice is contained in the report "*Scoping Paper: Review of Council's Response to Earthquake Prone Buildings*", which is attached to this submission as appendix 1. The decisions made by the Committee are attached as appendix 2.

The Council commends this report to the Royal Commission as it provides a high-level analysis of some key deficiencies, challenges and objectives for the performance of the built environment in earthquakes as seen by the Wellington City Council.

The Council notes that it is early days for its own review. There is much work to do before the Council can be definitive about the issues identified by the Royal Commission it seeks submissions and potential solutions on. With this caveat, further comment is provided below. The Council also requests the opportunity to be further involved in the hearings process, particularly as it relates to future measures and the role of Councils.

“Issue 3 - Legal and best practice requirements”

1. Definition of “Earthquake prone building” (EQPB)

The Council wishes to raise three key matters regarding the current legal definition of an EQPB:

- the reference to a “moderate” earthquake in section 122(1)(a) of the Act, which is subsequently defined in the “Building (Specified Systems, Change the Use, and Earthquake-prone Buildings) Regulations 2005” as an earthquake one-third as strong as the earthquake shaking that would be used to design a new building at that site (commonly referred to as “33 percent of New Building Standard or NBS ”).
- The references in s122(1)(a) to “ultimate capacity exceeded” and s122(1)(b) to “collapse”
- Section 122(2) which has the effect of excluding the vast majority of buildings used as dwellings from the definition of an EQPB.

1.1 “Moderate” earthquake

The Council notes that the definition of an EQPB sets both the strength threshold for when remedial action must be taken and, at least as interpreted by many Councils, the maximum level of strengthening that can be required for a building.

There has been much comment from the Wellington community on the 33% of NBS issue.

The Council notes the view expressed by a number of engineers that 67% of NBS may be a more appropriate threshold. The Council also notes the concerns of many building owners that higher thresholds impose higher costs, often greater than the value of the buildings being strengthened.

Previous cost benefit analysis¹ suggests that for both commercial and residential buildings:

- there is a compelling benefit to cost ratio in favour of undertaking strengthening work in regions where seismic risk is high
- the benefit to cost ratio of strengthening increases as the level of strengthening performance increases (i.e. from 33% of NBS to 100% of NBS) across all areas of seismic risk.

¹ Hopkins, D. C. (2008). "Report on Cost Benefit of Improving the Performance of Buildings in Earthquake." Department of Internal Affairs", Wellington.
 Thomas, G.C and Irvine J.D (2008) Post-Disaster Benefits of Upgrading Residential Dwellings Foundations, School of Architecture, Victoria University of Wellington, Paper to New Zealand Society for Earthquake Engineering Annual Conference 2008

From the perspective of total benefit compared to total cost, there appears to be a strong case for the threshold for defining an EQPB and the level of strengthening required being above 33% of NBS. This observation is based on previous analysis (as referenced in 1.1)

However, a macro analysis such as this ignores how costs and benefits are distributed across the community; and the differentials between individual buildings.

In the case of strengthening, the costs fall almost exclusively upon building owners, whereas some of the benefits are external and may be distributed throughout the community.

Similarly, the costs imposed on the wider community by the failure of a building are generally not borne by building owners. For example, building owners typically do not face the social and economic costs of fatalities, injuries, stress and anxiety, disruption of business activities, loss of investor confidence and reductions of tourism that can result from building failures. In this case the costs imposed on the wider community are external to the building owner.

The current commercial, policy and regulatory environment does not address these “externalities”. This has created what is almost certainly a systemic and substantial underinvestment in strengthening work.

The Council acknowledges, therefore, that the current threshold of 33% of NBS is essentially an attempt to balance imposing reasonable financial costs on building owners on the one hand and public safety objectives on the other.

This may have been a reasonable approach at the time the legislation was passed. However the Christchurch events demonstrate that a better approach is required in future where the benefits, costs and risks of people’s decisions are more accurately recognised in policy and regulatory frameworks and in the commercial environment.

The Council acknowledges that the responsibility to strengthen buildings lies with the owners. However it submits there may be a legitimate case to consider other financial arrangements if the outcome is preventing a far greater cost to the community and taxpayer at a future point. Options to consider might include insurance arrangements, taxation (deductibility), the role of EQC in preventative interventions and government incentives.

The Council submits that, in assessing and making recommendations on the legal threshold for an EQPB, the Royal Commission considers not only total cost, risk and benefit, but also:

- how those costs, risks and benefits are distributed across the community
- what legislative or other policy frameworks may be appropriate so that the costs and benefits of taking action are appropriately allocated across the community.
- what specific building upgrade factors may warrant public contributions e.g. heritage preservation

1.2 “Ultimate capacity” and “collapse”

The Council has identified a number of buildings that, although not otherwise legally earthquake prone, have elements such as balconies, parapets, chimneys, etc that are likely to fall and may cause death or injury in a moderate earthquake.

Such a building is not “dangerous” as defined under section 121 of the Act. Arguably it will not have its “ultimate capacity exceeded” in a moderate earthquake, meaning it is not “earthquake prone”.

On a number of occasions the Council has identified such risks and has asked owners to undertake remedial work. However, in some cases building owners have refused, arguing that the building does not meet the definition of earthquake prone (or dangerous) and that the Council therefore, has no power to require remediation.

The Council believes that hazardous elements on otherwise sound buildings can pose a significant threat to the public. Moreover, the cost of remediation of such elements is often modest.

Consequently, the Council submits the Royal Commission should give consideration to this issue, with a view to recommending that:

- the legislation be clarified
- Councils are empowered to require that elements on buildings that are likely to be hazardous in an earthquake of the threshold strength for an EQPB, be remediated
- consideration be given to developing standards and codes of practice guidance, as appropriate, to guide the remediation of hazardous elements on buildings.

1.3 Exclusion of most dwellings from the definition of EQPB

In general the Council does not consider it is appropriate to apply the same regulatory approach to single private dwellings as applies to commercial buildings and multi-story multi-unit dwellings. This is because there is clear evidence that the risk to life from New Zealand’s light timber / steel framed houses is low and that housing systems have generally performed well from a safety perspective.

However there is evidence that some particular elements on houses like concrete tile roofs, unreinforced masonry chimneys, and sub-standard foundations do pose safety risks. Moreover, widespread failures in the private building stock – even if not life threatening – can:

- greatly increase the economic costs of an earthquake
- lead to dislocation of communities and the need for emergency housing
- create long-term disruption and stress to people’s lives.

For example, at 14 September 2010, 14,000 of the 49,000 insurance claims arising from the 2010 Darfield earthquake were reportedly from chimney damage.

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Evidence² shows that the costs of mitigation before an event can be modest compared to total costs of remedy post-event. For example, Thomas and Irvine 2008 found that for a major earthquake in Wellington the total costs (to dwellings, contents, and indirect costs) of failures cause by sub-standard foundations alone was \$5.018 billion. This compares with \$291 million for remedying foundations. Even when the probability of a major event is factored in, remedying foundations was found to have a benefit to cost ratio of 4.25 – 8.5 to 1. The same study estimated that:

- deaths in private dwellings would fall from a projected 120 to 24
- the number of people needing emergency accommodation would fall from 42,900 to 16,000.

As noted above, the Council does not consider that single private dwellings should be treated in the same manner as commercial and multi-story multi-unit buildings. The Council also notes that there are likely to be substantial benefits from addressing the performance of single private dwellings in earthquakes, including public safety benefits.

In general, the Council anticipates adopting a non-regulatory approach to encouraging homeowners to improve the earthquake performance of their homes.

The Council submits that private dwellings should not be included in the legal definition of an EQPB (except multi-story multi-unit dwellings as is currently the case).

However, the Council requests that the Royal Commission considers in what circumstances, if any, Councils (or other entities) should have powers to require hazards or high-risk elements on private dwellings to be mitigated or remedied. It encourages the Royal Commission to make recommendations on this issue.

² Hopkins, D. C. (2008). "Report on Cost Benefit of Improving the Performance of Buildings in Earthquake." Department of Internal Affairs", Wellington.

2. Level of strengthening required for buildings identified as an EQPB

Regardless of the definition of EQPB ultimately legislated by Parliament, Councils (or such other entity as may be empowered) will need to determine the level of strengthening required once an EQPB has been identified.

At present a significant number of territorial authorities in New Zealand have interpreted the current legislation as allowing Councils' EQPB Policies to require identified EQPBs to be strengthened well beyond the 33% of NBS threshold. The remaining councils, including Wellington City Council, have interpreted the legislation to mean that once a building's strength exceeds the 33% of NBS threshold it is no longer an EQPB. Therefore the Council cannot require further strengthening.

To avoid uncertainty, potential delays and costly litigation, the Council submits that this issue be clarified in any new legislation.

The Council considers that, for transparency of the legislative framework, the threshold for an EQPB should also establish the maximum strengthening requirements that can be imposed by a local authority on a building owner. This is in the interests of equity between building owners and public safety.

3. Powers and Enforcement

The Council considers that the powers to require and enforce actions under a section 124 notice are generally adequate. The Council notes however, that few enforcement actions have been undertaken since building owners are generally still within the timeframes available to take remedial action.

One area where the Council seeks further clarification is in respect of structures that are attached to a building, but overhang or rest on public space. The Council believes it should be the responsibility of the building owners to meet all necessary safety standards and strengthening requirements for such structures. This would apply even though the building owner is not the owner of the land upon/above which the structure is located.

4. Change of Use Provisions

The Council considers that the change of use provisions contained in sections 114 and 115 of the Act are generally reasonable and adequate. The Council notes that the term "as nearly as is reasonably practical" is open to interpretation and has led to sometimes lengthy discussions with building owners. However, the Council does not consider the more legislative guidance or specificity is required at this time.

5. Role of Councils

As noted above the role of Councils in addressing the built environment and earthquake risk extends well beyond their legal powers and obligations under the Act.

Nonetheless, the Act provides key powers and functions for Councils and, in that respect, the Council notes that:

- Councils should continue to be the principal bodies responsible for ensuring that the earthquake performance of the existing building stock is improved where necessary.
- A degree of flexibility is required so that Councils can develop locally appropriate responses recognising local conditions, risks and community priorities. A community's appetite for risk from earthquake will need to be balanced with other local economic, social and environmental considerations.
- Councils can integrate their regulatory functions and powers with other interventions to create overall strategies not only to improve the built environment but also earthquake preparedness and emergency response.
- Council already has some ability through its District Plan to control building development on land prone to factors such as seismic risk, liquefaction and subsidence. However, in the case of earthquake risk factors Central Government strengthening of Councils' ability to control development in risk areas should be considered. This may necessitate changes to the RMA where the Commission considers seismicity considerations [not sure if we can remove the as or whether this is a typo, it doesn't make sense but if moved this way, may have to use it] a priority.
- Information collected by Councils can play a vital role in allowing markets and communities to make informed decisions about risk and priorities. In this respect, it may be appropriate to empower Councils to require building owners to provide (on say a 5 to 10 yearly basis) information on the assessed earthquake performance of individual buildings whether or not they are EQPBs. The rationale for this approach is to provide a balance between publicly displaying building performance information for users, and the cost to owners to regularly provide such evidence.

This information could be publicly available to allow better decision-making from building users, prospective buyers, financiers and insurers, and the wider community. Such a regime might be similar to the existing building Warrant of Fitness provisions, though less frequently required.

The Council requests that the Royal Commission considers whether the provision of such information to the market and wider community is justified and practical.

- The obligation on Councils to develop a policy on earthquake-prone buildings is sound. However, the legislation provides very little guidance to Councils on what may be appropriate minimum requirements of a Policy. For example in the Council's view, all policies established under the Act should actively identify EQPBs, publish this information, and require – in accordance with their local priorities and timeframes – remedial action to be taken. The Council does not consider that passive policies are appropriate.
- The preservation of built heritage values is particularly challenging. Section 6 of the Resource Management Act 1991 provides that “*the protection of historic heritage from inappropriate subdivision, use, and development*” is a matter of national importance which must be recognised and provided for by Councils, *inter alia*. There are however, conflicts between the protection of built heritage and public safety in an earthquake. Moreover, strengthening a heritage building to the current or a new strength threshold will not necessarily protect that building after a major event.

The Council requests that the Royal Commission investigates how existing legal frameworks provide for the protection of heritage values whilst providing for public safety. Further that it considers whether changes to the regulatory environment or other Government policies (such as taxation provisions or Government funding support) may be appropriate.

6. Other upgrade work – fire and access

The Council notes that earthquake strengthening work can be triggered by a threshold of NBS, a change of activity and will generally also trigger requirements for the upgrade of fire protection and access for people with disabilities.

While the Council strongly supports both of these objectives, the Council notes that other upgrade work can add to the overall costs of undertaking strengthening. This may impede building owners taking action to reduce earthquake risk given the layers of additional costs that may be imposed.

The Council requests that the Royal Commission investigates:

- whether there is evidence that requirements to undertake other upgrade work is acting to delay or prevent earthquake strengthening
- whether such requirements are justified in the interests of public safety – especially fire safety - and wider public policy.

“Issue 4 – Change of New Zealand Design Standards /Codes of Practice over time”

The Council does not wish to comment on technical aspects of the design standards. However, the Council wishes to comment on the design philosophy which underpins the standards.

In general, the design philosophy adopted in New Zealand is that the performance of buildings in a significant earthquake is such that the occupants of the building will be able to safely evacuate the building after the event. Buildings are generally designed to undergo controlled failure at known points, thereby absorbing and dissipating energy.

The Christchurch earthquakes demonstrated the effectiveness of this approach at protecting human life.

The events of Christchurch also demonstrate that this approach can lead to significant numbers of modern buildings needing to be demolished post-event. In the case of Christchurch such buildings include the Copthorne Hotel, Crown Plaza Hotel, Canterbury Convention Centre and the iconic Town Hall.

Such an outcome can greatly increase the long-term economic costs and disruption caused by a major event.

Costs of demolition and replacement and/or compensation tend to fall on the insurance industry and central Government. The former can be particularly significant, since the response of the insurance industry to such large losses may be to decline cover in future. This situation has flow-on implications for financing repair and recovery activities. In either case, substantial costs must be borne by all New Zealanders, in the form of insurance premiums, financing additional Government expenditure, or both.

The Council is aware that alternative approaches in engineering are now possible using “damage resistant design”³. Under this approach buildings are designed to both protect human life and be functional after a major event, either immediately or following low cost repairs. Moreover, the cost of such an approach may be the same or only marginally more than conventional design. For example, the Council has been advised that in the case of the Te Puni Village at Victoria University the additional cost of using a low damage design was just 0.5 percent of the total project cost.

Such an approach to building design could greatly enhance the resilience and functionality of cities after a major event, reduce recovery time, and substantially reduce the total risk exposure of building owners, insurers, and the Government. Such benefits are derived in addition to the primary standard’s objective of protecting human life.

³Refer Professor Andy Buchanan, “Time right for innovative engineers”, The Press 14 July 2011

The Council submits that:

- the issue of design philosophy, which underpins the building standards, should be fully evaluated
- recommendations should be made by the Royal Commission as to whether the current philosophy remains an appropriate approach to risk management and is ultimately cost effective.

“Issue 6 – Future measures”

Much of the Council’s commentary on the issue of future measures is contained in its submissions on issues 3 and 4. In particular:

New buildings

- Item a. Necessary changes to current design practice and
- Item b. Consideration of new technologies, including their cost

Please refer to the Council’s submission on Issue 4 – Change of New Zealand Design Standards /Codes of Practice over time.

Existing buildings

- Item b. The appropriate level of compliance with new building standards or alternative performance criteria, taking into account the cost of compliance

Please refer to the Council’s submission on Issue 3 - Legal and best practice requirements, section 1. Definition of “earthquake prone building”, subsection 1.1 “Moderate” earthquake.

The Council wishes to make two additional points; the first in respect of strengthening and/or preservation of heritage buildings and the second on timing of decisions.

Heritage buildings

The Canterbury earthquakes have demonstrated that regulatory protection for heritage buildings is not enough to preserve them for future generations⁴. Engineering solutions are also required, the cost of which may be beyond the reach of building owners or even local communities. Protecting heritage buildings may require strengthening well over the threshold for what is legally considered earthquake prone, and in some cases above 100 percent of NBS.

Section 6 of the Resource Management Act 1991 (RMA) describes “matters of national importance” and requires that Councils, in achieving the purpose of the Act - “shall recognise and provide for the protection of historic heritage from inappropriate subdivision, use, and development”. The practical effect of section 6 is to compel Councils to include regulatory protections for heritage buildings in their district plans. As a consequence property owners have far less flexibility in remediating earthquake risk.

The Council does not advocate any changes to section 6 of the RMA in response to perceived or actual risk to heritage from earthquakes. However, it is an important matter of public policy as to how the protection of heritage values, as Parliament has determined to be a matter of national importance, is to be

⁴Refer <http://www.historic.org.nz/en/TheRegister/Heritage%20Lost/Lost%20Heritage%202010-11.aspx>

reconciled with the protection of public safety embodied in both the RMA and Building Act. The commercial and financial realities are that there are often insufficient resources to “protect” (in an engineering sense) those buildings that ‘require’ regulatory protections under the RMA.

At present the Building Act and Government policy leave these issues almost exclusively in the hands of local Government. Section 131(2)(c) of the Building Act simply states that a territorial authority’s policy on EQPBs must state “how the policy will apply to heritage buildings”. Many territorial authorities deal with this aspect in their policies simply through saying that heritage buildings will be treated the same as any other building.

In terms of Government policy, the Council is advised that the costs of strengthening work are generally only depreciable not tax deductible for building owners.

In addition, the Historic Places Trust has been appropriated a modest \$0.563 million to support the preservation of privately held heritage across New Zealand⁵. This compares with the \$10.347 million appropriated⁶ to support biodiversity outcomes on private land and through community groups. Whilst still a modest amount it demonstrates the principle of a public contribution to the private sector in recognition of providing a public benefit element imposed by legislation.

The Council notes that the public policy issues arising in respect of biodiversity (also a matter of national importance under section 6 of the RMA) are very similar to those raised by the protection of heritage buildings.

The Council asks that the Royal Commission investigates whether the current policy settings for the regulatory and physical protection of heritage buildings:

- are likely to impede the remediation of heritage buildings that are at risk from earthquake or have elements that may be hazardous during an earthquake
- are likely to lead to the adequate protection of heritage buildings that are at risk from earthquakes
- make recommendation accordingly.

Reducing Uncertainty

The Council has received feedback from a number of owners of EQPBs that they are currently delaying taking decisions on their buildings given the uncertainty about what strengthening requirements will be imposed in future. This uncertainty is exacerbated by their historical experience of increases in performance standards during the lifetime of a building and therefore multiple capital upgrades being required.

While this is unavoidable to some extent, the Council asks that the Royal Commission recommends to Government that decisions, including new

⁵ <http://www.historic.org.nz/ProtectingOurHeritage/FundingProtection.aspx>

⁶ <http://www.treasury.govt.nz/budget/2011/ise/v3/ise11-v3-pia-conser.pdf> - page 43

legislation if necessary, are taken and implemented as quickly as possible to remove

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