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Proposals for Regulations under the Building (Earthquake-prone Buildings) Amendment Act 2016  
Ministry of Business, innovation and Employment  
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**Re: Proposals for (i) Regulations under the Building (Earthquake-prone Buildings) Amendment Act 2016 and for (ii) a methodology to identify earthquake-prone buildings**

This submission is from the Architectural Centre, an incorporated society dating from 1946, which represents both professionals and non-professionals interested in the promotion of good design.

**A. Introduction**

1. We consider these regulations to be important because they address issues of public safety, as well as cultural issues - in terms of the potential impact on heritage buildings.
2. However, action needs to be proportionate to actual, rather than perceived, risk. As the regulations consultation document acknowledges: "*society has a "scale aversion" to risk ... it is more averse to multiple-fatality events than it is to multiple single-fatality events*" (p. 40). This is clearly demonstrated by the seemingly current focus on, and investment in, earthquake risk over the significantly greater risk to life of motor transport (e.g. annual road toll: 327 (2016)<sup>1</sup>; 319 (2015); 293 (2014); 253 (2013); 308 (2012); 284 (2011) (total since 2011: 1784) c.f. deaths due to February 2011 Canterbury earthquake: 185 deaths).
3. We also note the New Zealand Society for Earthquake Engineering advice that "the risks in occupying a building performing at 33% NBS equates with the risk of flying in a commercial aircraft, or travelling 10,000 km or more by road per annum."<sup>2</sup>

**B. Proposals for Regulations under the Building (Earthquake-prone Buildings) Amendment Act 2016**

**a. Earthquake Ratings & EQPB register**

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<sup>1</sup> This is the road deaths up to 7 December 2016. Information on road deaths was gained from the Ministry of Transport. "Road Toll" *Ministry of Transport* (7 December 2016) <http://www.transport.govt.nz/research/roadtoll/>; "Annual road toll historical information" *Ministry of Transport* (7 December 2016).

<sup>2</sup> *Hamilton East Community Trust v Hamilton CC* (ENV 2013 ALK 000065) [10]

4. The proposal is to introduce two strata to the definition of earthquake-prone buildings based on current engineering guidelines categories: grade D (20-33%NBS) and grade E (<20%NBS). We are not clear of the value of this, especially given the "considerable uncertainties associated with assigning %NBS ratings, particularly at the lower end of the %NBS levels" (p. 28), and because it appears that the categories perform no regulatory function. Consequently, these categories of earthquake ratings appear to be relatively arbitrary, and meaningless.
5. We are aware that sometimes low %NBSs are a greater reflection of the level of the analysis of a building's structure, that an engineer has been able to do when calculating a %NBS, rather than necessarily the structural viability of a building. This is particularly true of historic buildings, and buildings with unusual (but not always obviously so) construction and structural systems. The fact that %NBS are not absolute and that more skilled engineers spending time analysing a building can shift an earthquake-prone building into a non-earthquake-prone building is an important message to communicate, especially for: heritage buildings; buildings which, if demolished, would displace and disadvantage vulnerable people (e.g. social housing); and for when the consequences of a low %NBS causes unnecessary cost and hardship, for example, for a poor rural community. The ethical ramifications of the system should not be forgotten.
6. In general, with the above caveat, we consider that the system of expressing a building's rating as a percentage of the New Building Standard (NBS) appears to work well.
7. We generally support publishing the earthquake rating on the EPB register (Proposals for Regulations, p. 26). We do however wonder if any work has been done to understand the impact of such a register on property values and any unintended consequences which may undermine the capacity of a building owner to strengthen their building (e.g. due to reduced access to finance because of a devalued property).

#### **b. Assessments**

8. The emphasis of the Act (and consequently the proposed regulations) is on building structure and the likelihood of building collapse. This is despite injury and death being more likely to be caused by falling internal fixtures, fittings, furniture and equipment etc. in New Zealand earthquakes. As WREMO have noted, in their defence of the "*drop, cover, hold*" advice (c.f. the competing "*triangle of life*" theory advocated for third world countries): "We have robust building standards in New Zealand and do not expect buildings to collapse." Instead they state that falling objects, not buildings present the real threat.<sup>3</sup>
9. Consequently, these aspects of the interior need to be factored into assessments including the risk assessments for applications for exemptions. Could this be addressed in revisions to the *Engineering Assessment Guidelines* (Red Book)?

#### **c. Earthquake-Prone Building (EPB) and Exemption notices requirements**

10. We support national consistency regarding these forms, but otherwise have no comments to make regarding the Exemption notices.

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<sup>3</sup> Thomas, Rachel "Civil Defence slams controversial "triangle of life" earthquake survival technique." *Stuff* (30 November 2016) <http://www.stuff.co.nz/national/nz-earthquake/87033356/civil-defence-slams-controversial-triangle-of-life-earthquake-survival-technique>.

11. The proposal for black and white EPB notices appears to us to reduce the likelihood of notices being seen by members of the public - though we consider that the proposed inclusion of orange in the <20% NBS would assist (p. 30 and Appendix 6).
12. We are not convinced that any confusion between the notices associated with dangerous or insanitary buildings that should not be entered, with the notices for earthquake-damaged buildings, which are unsafe and should not be entered, is a significant problem. The most important thing is to convey the fact that the building is unsafe to enter to the public. Equally any possible confusion between different reasons for restricted access (post-disaster vs earthquake-damage) is very much secondary to conveying the restricted access status (p. 30).
13. We are particularly concerned about the potential for a structurally-sound building to be inappropriately demolished due to the Act requiring Territorial Authorities to "proceed as if it had determined the building or part to be earthquake prone" (e.g. s133A(3)(a); s133AK(4)(a)(i)) when a building owner fails to provide an engineering assessment. This is likely to negatively and unnecessarily impact on heritage buildings, many of which are likely to have idiosyncratic construction and structure. Building demolition is usually: disruptive to business (due to cessation of business, but also disruption for neighbouring businesses), a less sustainable outcome than retaining and upgrading a building, and may have negative heritage and/or streetscape consequences. For economic, environmental and cultural reasons, building demolition needs to be carefully considered, and should require a Detailed Seismic Assessment (DSA).

#### **d. Substantial Alterations**

14. The Architectural Centre supports the idea that building owners making substantial alterations be required to also address earthquake strengthening.
15. We support this because we suspect many building owners would normally incorporate earthquake strengthening into major building upgrades because of cost efficiencies related to the cost of vacating a building only once, and the cost of making good interiors affected by alterations. In addition, there is a high likelihood, in tenanted buildings, that the degree of earthquake performance is a driver for major alterations. Consequently this does not appear to be an onerous expectation.
16. We agree that the definition of "substantial alteration" must be straightforward.
17. The proposed definition of "substantial alteration" is "building work requiring a building consent that has a value that is more than 25% of the rateable value of the building" (p. 36).
18. While we can see the ease of calculation being a distinct advantage, we are not sure that a financial measure will be reliable.
19. This is because financial cost is easy to manipulate when it is an estimate at the point of building consent rather than actual cost. Instead we would favour a percentage of the square meterage of work done: gross floor area.
20. We agree that a financial definition "could create issues for small centres where property values were generally not high" (p. 34). We suspect that even a square meterage system may have similar issues, and it may be appropriate to

specify different percentage values for areas with large versus small populations.

21. We agree that building owners undertaking phased remedial work should be exempt from "substantial alterations" provisions (p. 35).

**e. Exemptions**

22. The proposal is that discretion for exemptions be at the territorial level, with a number of criteria needed to be considered.
23. A building might be capable of holding 300 people (e.g. a town hall in a rural location) but due to economic and social context, it is highly unlikely that 300 people would use the building. There is rural infrastructure which was built for a different New Zealand and this needs to be recognised through evaluating likely occupancy rather than building capacity. A parallel example already exists with fire regulations where egress compliance is lower than building capacity.
24. Regarding frequency of occupancy, we recommend amending the suggested categories of:
- a) <25;
  - b) 25-100;
  - c) >100
- to:
- a) "once a fortnight or less" ( $\leq 26$  times);
  - b) "more than once a fortnight and up to twice a week" (27-104 times);
  - c) "more than twice a week" (>104 times).
25. The reason for this is that these thresholds are less arbitrary and better reflect likely thresholds of social useage.
26. We note that the definition of seldom, occasional and frequent differs on p. 43 (the proposed wording of the regulations) from pp. 41, 44. We support the p. 41 definition with the amendments we suggested above.
27. We agree that the following ought to be considered in relation to applications for exemptions:
- (a) the seismic hazard area of the building (p 44).
  - (b) the extent of impact of failure on a neighbouring building
28. We consider the following would be usefully included to be considered in relation to applications for exemptions:
- (a) fixing of interior fixtures etc.
  - (b) building maintenance
  - (c) building condition
29. We also note that building age is a misleading parameter because we consider that a more relevant issue, with respect to building quality, is the historic economic context (e.g. buildings built in the 1930s Depression are much more vulnerable than many older buildings because of the poor quality of building work carried out then). It would be useful for MBIE to identify periods in New Zealand's history of poor building construction and relate consideration of risk to this, rather than a crude linear building age.

30. We recommend that practice across territorial authorities, in relation to exemptions, be reported and collated to understand practices country-wide and inform any revision of regulations.

#### **f. Priority buildings**

31. The description of priority buildings in the Act includes "a building that is likely to be needed in an emergency for use as an emergency shelter or emergency centre" (s133AE (1)(b))

32. This is likely to capture schools, which are funded by the Ministry of Education, community building, funded by local councils, and other buildings such as churches and wharehenui, which are often owned by communities which do not have access to funds of a size viable for earthquake strengthening. Both marae buildings and churches are often old buildings. 70% of the 1300 marae buildings registered at Te Puni Kōkiri are over 50 years old. These are important cultural buildings and are often not heritage-listed. During the most recent earthquakes marae have been important contributors to post-quake support infrastructure, often because - in addition to their physical facilities - marae have a social and cultural infrastructure underpinned by the fundamental importance of manaakitanga. We believe an important role of these regulations is to prevent increased financial burden to hapu, in relation to the upkeep of marae, to the detriment of post-quake support. We suggest: increasing timeframes to meet the requirements of the regulations, provision of financial support for any marae identified as priority buildings due to an anticipated post-quake role, and identifying a role for Te Puni Kōkiri in assessing the cultural consequences of the regulations and the viability and need for earthquake strengthening of wharehenui, wharekai and other marae buildings.

#### **g. Heritage buildings**

33. The Act defines "heritage building" as: "a building that is included on - (a) the New Zealand Heritage List/Rārangi Kōrero ... (b) the National Historic Landmarks/Nga Manawhenua o Aotearoa me ōna Kōrero Tūturu list." (s7).

34. The Architectural Centre believes that this heritage definition is too narrow. This is because many of the buildings listed on District Plans are not on the Heritage New Zealand list because they are identified as being a low priority for Heritage New Zealand because their District Plan listing means that they are explicitly legally protected (unlike buildings listed with Heritage NZ). This means that the Act is potentially omitting a significant sector of formally-recognised heritage buildings. We see this omission as needing to be addressed in an amendment to the Act.

35. Because of the acknowledged importance of the cultural role of heritage buildings we strongly encourage that a Detailed Seismic Assessment (DSA) be required before any decision regarding demolition of a heritage building be made. We also strongly suggest that the seismic assessment be made publicly available because of the public interest "to provide the public with clear information about the earthquake risk of specific buildings" (p. 25).

#### **C. Proposals for a methodology to identify earthquake-prone buildings**

36. It appears to us that decision-making is proposed to occur on potentially less information than current (i.e. IEPs vs profile categories) (pp. 17-18). It also seems to us that the catchment of building owners receiving notification that they own a potentially earthquake prone building will increase. For example one third of pre-1976 reinforced concrete buildings higher than two storeys are likely to be earthquake prone - but 100% of the owners will be notified. How

does this compare with notification (and consequently costs to building owners) under the current system? Given the "limited information on the building stock as a whole" (p. 16) this appears to have a degree of recklessness.

37. In addition to a potentially greater number of building owners affected, the shift of the cost of Initial Evaluation Protocols (IEPs) by TAs to Initial Seismic Assessments (ISAs, or DSAs) by building owners shifts costs from council to building owners. This further strengthens the case for earthquake strengthening to qualify for tax deductions.
38. We suspect that heritage buildings will be more vulnerable under this system, which could prompt a building owner to demolish a building simply because it is a URM, a pre-1976 concrete highrise, or a pre-1935 reinforced concrete building (p. 17).
39. Many historic buildings are important contributors to streetscape and built environment character, and play an important role in the economy, from tourism to job-creation. Much of this economic benefit accrues to the wider community rather than the individual building owner, again suggesting that the collective benefits of owners earthquake strengthening their buildings should be acknowledged by some form of tax relief. This is in addition to the role of heritage buildings in representing collective cultural values. This is not to advocate for the uncritical retention of all old buildings, but rather to recognise the importance of many of them, and consequently the importance that earthquake assessments are as accurate as possible and able to properly determine when demolition or strengthening is an actual requirement. Because of this we strongly recommend that owners of potentially earthquake-prone buildings which are heritage buildings be required to obtain a DSA to enable informed decision-making. We support MBIE facilitating a discounted DSA system for heritage buildings, including non-listed buildings where there is evidence of heritage value
40. Equally there are some buildings the loss of which would cause significant upheaval to vulnerable groups of society. Social housing is such a category. Again we strongly recommend that owners of all social housing (whether private- or state-owned) which is deemed to be potentially earthquake-prone are required to obtain a DSA. Again, we support MBIE facilitating a discounted DSA system for buildings, such as social housing, which require greater certainty of evaluation.
41. If Categories A to C are to be used for targetting buildings then we recommend:
  - (i) further analysis of the data and (ii) that regulations are written to enable the profile categories to reflect ongoing analysis. We specifically recommend four aspects be considered in new analysis of the data:
    - a) date bands which correspond to historic economic context. As noted above, it is known that buildings built in the Depression are not as well built as those in more prosperous eras (e.g. the 1870s). We suspect that rather than a correlation with age (i.e. the older the more earthquake-prone) that there is an historic correlation with economic context.
    - b) maintenance. In the Canterbury earthquakes the problem was not unreinforced masonry buildings per se, but rather URM buildings which were poorly maintained - specifically those whose internal gutters were not cleaned causing structural timber (which was key to holding the building together) to rot, undermining the structural performance of the building as designed. This points to the need for maintaining buildings as an

important part of earthquake-prone building prevention, and to building condition as a parameter worth examining in the dataset. Incorporating maintenance as a parameter would also, we hope, send a message encouraging building maintenance and consequently improve the quality of building stock.

- c) government buildings by the Ministry of Works. A number of large public buildings will be caught by the Category B description. Given the high levels of quality control in buildings constructed by the Ministry of Works we wonder if this is a mitigating parameter. We acknowledge that building code changes following the Napier earthquake may be an important threshold for this parameter, but we consider it may be worth reviewing the data in relation to this.
  - d) marae. Given the cultural importance of marae, and the lack of funding available in these communities for extensive building up-grades, accurate information is important to properly understand the seismic risks involved. Examining the database for the statistical likelihood of marae as seismically-vulnerable would productively inform decision-making.
42. We support a centrally-held deposit (e.g. council) of engineering drawings and any engineering reports (p. 23). Clearly digitising these for heritage buildings and storing the material on a server outside of the relevant area will enable less interruption to building information post-quake.
43. In relation to the comment above regarding the risks caused by inadequately fastened interior fixtures, how will the risk of interior fixtures and fittings be monitored (p. 25), especially given the fact that injury and death in New Zealand earthquakes is more likely from this cause than building collapse?
44. Collapsing buildings and falling interior fixtures are not only caused by the shaking caused by earthquakes. Fire and tsunami are other earthquake-related risks which impact on building performance. How are these incorporated into risk assessments?

#### **D. Other Issues**

45. The Act and regulations appear to assume two outcomes for earthquake-prone buildings: earthquake strengthening or building demolition. We consider that there are at least two additional alternatives:
- a) long-term temporary propping and/or scaffolding of buildings. This is a safe option but, for some, aesthetically-challenging.
  - b) repurposing. It is viable for earthquake-prone buildings to be repurposed for function which have low occupancy or low frequency of use. We encourage MBIE to put together a list of potential building functions appropriate for earthquake-prone buildings (e.g. storage, server farms) which reduce the risk to people by reducing the numbers of people using them. We are also aware that change of use can trigger onerous conditions related to compliance and we would encourage greater flexibility by local authorities to accommodate different uses.
46. The importance of immediate but temporary propping being seen as a viable option - as we have seen about Wellington in recent weeks - is that the disruption to urban life is minimised. Strategies such as this are important to prevent the emptiness that plagued Christchurch's city centre in the immediate

aftermath of the Canterbury earthquake, and still impacts to some extent even today.

### **Conclusion**

47. Ultimately it is critical that this process be underpinned by good information because there is much at stake in terms of environmental, financial and cultural costs if buildings are demolished needlessly. We strongly encourage the Ministry to be pro-active and progressive in supporting increasing better and more thorough structural assessments, as investment and support at the beginning of the EQPB process may, in the long run, produce savings in all of these areas.
48. We also acknowledge that, as with many aspects of life, there is never no risk in terms of building performance and earthquakes. The impact of different types (as well as strengths) of earthquakes will be felt differently on different buildings and it is ultimately impossible to predict and 100% protect against damage, death and economic disruption. But we again reiterate our opening words that an evaluation of risk and an appropriate and proportionate response is important.

Thank you for this opportunity to comment on the draft Proposals for Regulations under the Building (Earthquake-prone Buildings) Amendment Act 2016. If you have any questions please do not hesitate to contact me.

Yours faithfully



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