NEW ZEALAND
GEOTECHNICAL
SOCIETY INC

A Collaborating Technical Society
of The Institution of Professional
Engineers New Zealand

BUILDING (EARTHQUAKE-PRONE BUILDINGS) AMENDMENT ACT 2016

SUBMISSION TO MBIE ON PROPOSALS FOR REGULATIONS

27 January 2017

Introduction

The New Zealand Geotechnical Society (NZGS) is the affiliated organisation in New Zealand of the International Societies representing practitioners in Soil Mechanics (ISSMGE), Rock Mechanics (ISRM) and Engineering Geology (IAEG). The NZGS is also affiliated to the Institution of Professional Engineers NZ (IPENZ) as one of its Collaborating Technical Societies and currently has over 1000 members.

The aims of the Society are:

1. To advance the education and application of soil mechanics, rock mechanics and engineering geology among engineers and scientists
2. To advance the practice and application of these disciplines in engineering
3. To implement the statutes of the respective International Societies in so far as they are applicable in New Zealand
4. To ensure that the learning achieved through the above objectives is passed on to the public as is appropriate

The NZGS is very interested in earthquake hazards and the risk they pose to society, and in the performance of the ground and of structures that may be affected by it. The NZGS considers the Earthquake Prone Building (EPB) legislation a very important part of managing earthquake risk to society. We have been closely involved in the development of the Engineering Assessment Guidelines, and endorse where they have landed. This was a component of our submission on the underlying EPB legislation.

The NZGS supports the general approach proposed, and in particular the risk based approach to identifying and remediating earthquake prone buildings (identifying priority buildings, different timeframes in areas of differing seismic risk, and potential exemptions based on occupancy and

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frequency of use). This was one of the main platforms of our submission on the underlying EPB legislation.

The NZGS believes that the EPB system needs to consider a broader context of earthquake risk. Whilst the Building Act, Building Code, national standards, and guidelines exist to control the design and construction of new buildings, the NZGS considers that the evaluation process for existing buildings remains too narrow. As part of the EPB system, site and local hazards should be considered in conjunction with structural performance. Such hazards include rockfall, liquefaction, slope movement and ground rupture. These can cause damage to buildings and, in extreme cases, result in fatalities. These geological hazards were significant in the Christchurch and Kaikoura earthquakes.

Specific Recommendations

Enduring definition of a moderate earthquake (Section 2.2, p.13)

This is defined in section 2.2 as being of same duration and one third as strong as the earthquake shaking for new building design that is in place when the Amendment Act commences (notionally 1 July 2017), and is as defined by NZS1170.5:2004. While the need for a common standard is important for achieving a uniform minimum level of building seismic performance, it is becoming more and more apparent that the 2002 national seismic hazard model that underpins NZS1170.5 (and the NZTA Bridge Manual seismicity maps that are also widely used) is in need of updating, and that the seismic hazard is under-represented in some places. NZS1170.5 will ultimately be updated, and the seismic loading portion will be revised. In our view, a mechanism should be outlined or at least alluded to that will allow significant changes in seismic design standards in a region to ultimately be reflected in the assessed %NBS of a building. There could quite reasonably be a lag in this but eventually the new building stock will be reflecting the updated design standard, and the relative performance of the older stock may reduce, and warrant improvement. As a suggestion, perhaps any revision to the seismic hazard defined by NZS1170.5 (which won't occur particularly frequently) that results in a change in the Z value of 10% or more could trigger a revision to the %NBS assessment. The Chief Executive (of MBIE) could, perhaps, identify the areas affected and nominate the time period for reassessment and remediation (for newly categorised structures).

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Ultimate Capacity definition (Section 5.1.3, p.22)

The NZGS considers the definition of ultimate capacity to be overly simplistic, as it only mentions gravity loads and vertical support. While these are the most fundamental considerations, it would be useful to identify other loads or loading directions that may be coincident with earthquake loading – such as lateral earth pressure.

Site hazards that do not directly affect building performance in earthquakes should be indicated on Notices (Section 5.2.6, p. 29)

These regulations relate to the Building Act, and only to earthquake performance of buildings where people may be affected by their partial or full failure. The adjacent ground may present hazards (eg rockfall, failure of retaining walls that don't directly support a building, liquefaction and lateral spread and fault rupture) which are specifically excluded from assessment of %NBS but which are intended to be identified and reported in conjunction with a detailed seismic assessment. These hazards may be as important to someone entering a site as the performance of the building located on it. We recommend provision is made for documenting external site hazards on any earthquake prone building notices, and separately where they are significant but the structure on the site is not earthquake prone and doesn't otherwise require a notice.

Conclusion

The NZGS appreciates the opportunity to make this submission. We would welcome the opportunity to speak to our submission.

Please feel free to contact the undersigned if you require any clarification of this submission.

Yours faithfully

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