

LETTER TO THE EDITOR

With reference to paper:

Earthquake Risk (Prone) Buildings - The Gisborne Experience

J D Wells, Vol 29, No 3, September 1996

In the above article, Mr Wells sets down the experiences of the Gisborne District Council at this most difficult interface of engineering technology and building regulations. The Earthquake Risk Buildings Study Group of the Society commends Mr Wells for writing this paper; it is only by sharing experiences in this way that other territorial authorities and practitioners can be informed of developments in this area.

There are three areas in this paper that require comment on behalf of the Society's ERB Study Group.

Firstly, there is a need to amplify the point that the author makes regarding the changes between section 624 of the Local Government Act and section 66 of the Building Act.

He contends that the inclusion of the words "catastrophic collapse causing bodily injury or death" in the Building Act in place of "constitute a danger to persons" from its predecessor narrows the subset of earthquake prone buildings even further. As he notes, the Society has reluctantly agreed that this interpretation is likely to be correct from a legal perspective.

The Society however notes that there was no technical intention to change the scope of application, and believes that the original interpretation should apply. This perspective is supported by the article in the November 1995 edition of *BIA News* [9], in which the effect of late changes by the Select Committee in the leadup to the finalisation of the Act is clearly outlined.

Section 66 of the Building Act is currently being reviewed by the Building Industry Authority, with input from the Society, as part of a review of the dangerous and insanitary provisions. While it is hoped that the scope of section 66 can be widened to encompass more than just unreinforced masonry buildings, anomalies in the wording such as the above example will definitely be addressed.

The second aspect relates to the use of known performance in recorded earthquake events as means of assessment as to whether or not a particular building would withstand a legal "moderate earthquake". While the two Gisborne earthquakes to which the author refers were relatively well recorded and documented, considerable caution needs to be exercised if such an approach is to be used.

The premise of known earthquake performance relates only to (i) the actual direction and characteristics of the specific earthquake, and (ii) to the building and its neighbouring structures in their current form. The theoretical assessment of the lateral capacity of a building is typically based on the subject building on a standalone basis, that is, not gaining lateral support from adjacent buildings, as is frequently the case in reality. Any departure from this traditional approach would also require a dependable means of territorial authority record keeping in order to review EPB assessments if any significant structural alteration to or the demolition of the neighbouring structures was undertaken.

For these reasons the generally more conservative calculation-based approach is recommended by the Study Group.

Thirdly, the Study Group concurs with the author's opinion that Section 46 (Change of Use) of the Building Act represents a more effective tool under the current legal framework for requiring comprehensive strengthening. Unfortunately it appears that many territorial authorities are not making use of this mechanism as a means of achieving risk reduction, but are only seeking the low strengthening levels that have historically been considered acceptable for this type of structure (ie one half or two thirds of Chapter 8, NZS 1900:1965).

The strengthening levels recommended in the Study Group's 1995 draft document dealing with unreinforced masonry buildings (reference 8) correspond to approximately 45% of full NZS 4203:1992 force levels for Category IV structures with other than high occupancy. The document suggests that these levels be used as a minimum reference point for consideration of "reasonably practicable" in terms of change of use.

Two thirds of NZS 1900 corresponds to only approximately 16% of full NZS 4203 elastic levels.

The treatment of unreinforced masonry buildings is a sensitive issue in terms of public awareness and expectation. Moreover, the engineering uncertainties associated with these buildings are considerable. Accordingly, an engineering approach to the classification and assessment of these buildings which errs on the conservative side would therefore seem appropriate, even if in some cases legal considerations are subsequently found to govern in the context of the current Act.

ADDITIONAL REFERENCE

- 9 Building Industry Authority, 1995. *BIA News*, No. 51, November

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