

NON-EPB SEISMIC ASSESSMENT GUIDELINES FOR CONCRETE BUILDINGS 2024

BACKGROUND TO CONSULTATION

Provided by Compusoft Engineering on behalf of the Joint Committee for Seismic Assessment and Retrofit
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Engineers in New Zealand are frequently required to undertake Detailed Seismic Assessments (DSAs) of existing buildings. The process of undertaking a DSA is defined in the *Technical guidelines for undertaking engineering assessments* [1], referred to in this paper as “the guidelines”. Section C5 of the guidelines is a key source of guidance on how to undertake DSAs for the large proportion of existing buildings that are constructed from reinforced concrete.

Two versions of Section C5 are in use in New Zealand. The original version published in July 2017 is referenced by the Earthquake Prone Building Methodology [2] and consequently must be used for ‘legislative’ DSAs. i.e. those required to determine if a building is potentially earthquake prone or when the use of a building is changed. The improved 2018 version [3] is used for other ‘market’ DSAs required for commercial purposes such as informing tenants or potential purchasers about the seismic capacity of a building. As well as providing more technically correct guidance for assessment of concrete buildings than the July 2017 Guidelines [1], C5-2018 has been found by the industry to be easier to use and hence likely to give more consistent assessment outcomes [4,5].

Since publication of C5-2018, the structural engineering profession has identified that C5-2018 and other Sections of the 2017 Guidelines require updating so that the consistency and appropriateness of concrete building assessments are further improved. The reasons driving the need for these updates can be divided into three categories:

1. Clarifications of existing assessment criteria,
2. Updating Sections of the 2017 Guidelines to make them consistent with C5-2018, and
3. Updating of provisions to ensure that C5-2018 and the 2017 Guidelines represent current understanding of the behaviour of concrete buildings.

During early 2023 Compusoft Engineering were commissioned by MBIE to develop change proposals for Sections C1, C2, C3, C5, and C7 of the guidelines. The development of these change proposals was recommended, and has been supervised, by the Joint Committee on Seismic Assessment and Retrofit (JCSAR).

These change proposals are now being publicly consulted on, with it anticipated that they will lead to publication of 'non-legislative' versions of Sections C1, C2, C3, and C7 during 2024, along with a further update to Section C5.

DEVELOPMENT PROCESS

The process used to develop the change proposals has comprised:

- Discussion of areas of potential change with a review committee of Subject Matter Experts (SMEs),
- Development of proposed changes by Compusoft Engineering,
- Review of proposed changes by SMEs and updating where necessary by Compusoft Engineering,
- Formal balloting of the change proposals by a group of SMEs¹ using a process adapted from the American Concrete Institute (ACI) that was provided by the JSCAR.

The change proposals have also been socialised to industry through presentations to SESOC's Auckland and Wellington Structural Groups, discussion during a plenary session at the NZSEE conference, and in a paper published in the SESOC Journal [6].

SUPPORTING DOCUMENTATION

Public comment documents comprise a summary of the proposed changes, including the need for and justification of the changes, and copies of the proposed Parts formatted to show:

- New text, coloured red,
- Moved text, coloured green,
- Change bars alongside text that has been altered.

To improve clarity and readability, deletions have been hidden in the proposed Parts.

The feedback form provides a summary of each change that is similar to the summary in the provided PDF. Additional columns identify whether each change is editorial or more substantive, and provide a space to record comments regarding any changes you wish to provide feedback on. Feedback does not need to be provided on all changes – it may be provided on as few as one individual change. The feedback form is protected to prevent editing other than in the feedback column. It can however be filtered so that editorial changes can be hidden if desired.

EXPECTED IMPACT OF PROPOSED CHANGES

At the date of this paper no quantitative evaluation of the impact of proposed changes on assessment outcomes has been undertaken.

¹ The balloting group included some of the SMEs involved in development, along with others nominated by the JSCAR.

Qualitative consideration indicates that the proposed changes will generally improve assessment outcomes and result in higher earthquake ratings for many buildings. In particular, earthquake scores for diaphragms and precast concrete floors are expected to improve if the proposed changes are adopted.

REFERENCES

- [1] MBIE, NZSEE, EQC, NZGS, and SESOC (2017) *The Seismic Assessment of Existing Buildings: Technical Guidelines for Engineering Assessments* (Technical Guidelines for Engineering Assessments). Ministry of Business, Innovation, and Employment, Wellington, New Zealand.
- [2] MBIE (2017) *EPB Methodology: The Methodology to Identify Earthquake-Prone Buildings*. Ministry of Business, Innovation, and Employment, Wellington, New Zealand. 24p.
- [3] MBIE, NZSEE, EQC, NZGS, and SESOC (2018) *Technical Proposal to Revise the Engineering Assessment Guidelines - Part C5 Concrete Buildings*. Ministry of Business, Innovation, and Employment, Wellington, New Zealand. 252p.
- [4] Engineering New Zealand (2019) *C5 Evidence Project - Phase One Report*. Engineering New Zealand, Wellington, New Zealand. 22p.
- [5] Engineering New Zealand (2021) *C5 Evidence Project - Phase Two: Final Report*. Engineering New Zealand, Wellington, New Zealand. 35p.
- [6] Brooke, N. J. (2024) Updating New Zealand's Guidance for Seismic Assessment of Existing Concrete Buildings. *SESOC J.* **37**(1), pp.27–38.