BUILDING PERFORMANCE

Seismic assessment of existing buildings

All content related to B1 Structure (https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/)

Guidance

Part A: Assessment objectives and principles

[PDF 1.3 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/a-assessment-objectives-principles.pdf)

Part B: Initial seismic assessment

[PDF 1.6 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/b-initial-seismic-assessment.pdf)

Section C1: General issues

[PDF 673 KB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c1-general-issues.pdf)

Section C2: Assessment procedures and analysis techniques

[PDF 2.8 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c2-assessment-procedures-analysis-techniques.pdf)

Section C3: Earthquake loading

[PDF 973 KB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c3-earthquake-demands.pdf)

Section C4: Geotechnical considerations

[PDF 1.9 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c4-geotechnical-considerations.pdf)

Section C5: Concrete buildings

[PDF 4.9 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c5-concrete-buildings.pdf)

Section C6: Structural steel buildings

[PDF 1.8 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c6-structural-steel-buildings.pdf)

Section C7: Moment resisting frames with infill panels

[PDF 1.5 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c7-moment-resisting-frames-infill-panels.pdf)

Section C8: Unreinforced masonry buildings

[PDF 10 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c8-unreinforced-masonry-buildings.pdf)

Section C9: Timber buildings

[PDF 1.1 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c9-timber-buildings.pdf)

Section C10: Secondary structural and non-structural elements

[PDF 1.7 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/c10-secondary-structural-non-structural-elements.pdf)

Engineering assessment summary report template

[DOCX 39 KB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/engineer-seismic-assess-summary-report-template.docx)

Initial evaluation procedure (IEP) assessment template

[ZIP 2.6 MB]
(https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/initial-evaluation-procedure-assess-template.zip)

About these documents

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Of interest to Building users, Territorial Authority, Building consent authorities, Building owners, Designers, Engineers, Architects

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Introduction

The Engineering Assessment Guidelines (the guidelines) provide a technical basis for engineers to carry out seismic assessments of existing buildings within New Zealand. The guidelines support seismic assessments for a range of purposes, and must be used by territorial authorities to decide whether or not a building is earthquake prone in terms of the Building Act 2004.

Contents

The guidelines provide the assessment component of the earthquake-prone building regulations and EPB methodology (https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/methodology-identify-earthquake-prone-buildings/) that came into force on 1 July 2017. Version 1 of the guidelines must be used for all engineering assessments that territorial authorities use to decide whether or not a building is earthquake prone.

The guidelines provide methods for two levels of assessment. Initial Seismic Assessment (ISA) provides a broad indication of the likely level of seismic performance of a building. In some cases, an ISA will be followed by a more comprehensive Detailed Seismic Assessment (DSA).

Both assessment methods rate a building as a percentage of the new building standard applied to an equivalent new building on the same site. For assessment purposes, new building standard refers to the minimum life safety performance requirements of Building Code clause B1 – Structure.

Outline of the Engineering assessment guidelines

The guidelines have three distinct parts.

Part A – Assessment objectives and principles
Part A outlines the scope and application, and provides a general overview of the seismic assessment process. It describes the linkage with the relevant requirements of the Building Act 2004, associated regulations and the EPB methodology.

Part B – Initial seismic assessment
Part B describes the Initial Seismic Assessment (ISA). The ISA provides a broad indication of the likely level of seismic performance of a building. In some cases, an ISA will be followed by a Detailed Seismic Assessment.

Part C – Detailed seismic assessment
Part C describes the Detailed Seismic Assessment (DSA). The DSA provides a more comprehensive assessment than an ISA.

Part C is published in ten independent sections. Sections C1 to C4 collectively build on Part A and are to be used in conjunction with guidance for specific materials in Sections C5 to C10.

- Section C1 provides an overview to the DSA process. It explains the objectives and sets out key steps for an assessment at this level, including specific guidance on the calculation of an earthquake score in the context of a DSA.
- Section C2 sets out a DSA procedure. It specifies general analysis requirements including basic assumptions, selection of seismic analysis procedures, and the consideration of structural weaknesses.
- Section C3 explains how to determine the earthquake hazard and loading requirements used to assess the Ultimate Limit State (ULS) demand that relates the building capacity to the standard required for a new building.
- Section C4 provides guidance for considering geotechnical behaviour and its impact on the seismic behaviour and earthquake rating of existing buildings. This section includes guidance on the recommended interactions between structural engineers and geotechnical engineers and their particular roles and responsibilities.
- Sections C5 to C9 provide assessment methods for the specific construction materials of existing buildings:
    - C5 – Concrete buildings
    - C6 – Structural steel buildings
    - C7 – Moment resisting frames with infill panels
    - C8 – Unreinforced masonry (URM) buildings
    - C9 – Timber buildings
- Section C10 gives specific recommendations for assessing Secondary Structural and Non-Structural (SSNS) building elements. The guidance in this section allows these elements to be rated either independently or in conjunction with an overall building assessment.

Templates

The Initial Evaluation Procedure (IEP) assessment template [ZIP 2.6MB] (https://www.building.govt.nz/assets/Uploads/building-code-compliance/b-stability/b1-structure/seismic-assessment/initial-evaluation-procedure-assess-template.zip) (note: this is a maco-enabled spreadsheet supplied in a ZIP file) provides working versions of tables IEP-1 to IEP-5.

The assessment summary report is used to summarise the key points from initial seismic assessments (Part B) and detailed seismic assessments (Part C) and must be included at the front of all engineering assessments for earthquake-prone buildings purposes.

Related information

- The methodology to identify earthquake-prone buildings (EPB methodology) (https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/methodology-identify-earthquake-prone-buildings/)
- Managing earthquake-prone buildings (https://www.building.govt.nz/managing-buildings/managing-earthquake-prone-buildings/)
- What you need to know: Section C5 'Concrete Buildings' proposed revision (https://www.building.govt.nz/building-code-compliance/b-stability/b1-structure/what-you-need-to-know-section-c5-concrete-buildings-proposed-revision/)

All guidance documents related to B1 Structure(https://www.building.govt.nz/search/?bcc%5B%5D=b1-structure&area=guidance&show=all&action_doSearch=Search&sort=recent#results)

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