

# Assessing Existing Base Isolated Hospital Buildings

## Overview of draft

Chile-NZ Seismic Design of Hospitals Workshop - July 2024



of Base  
Buildings

# Seismic Assessment of Isolated Hospital Buildings

Technical Guidance Note

June 2024

Version 0.2 WIP Draft

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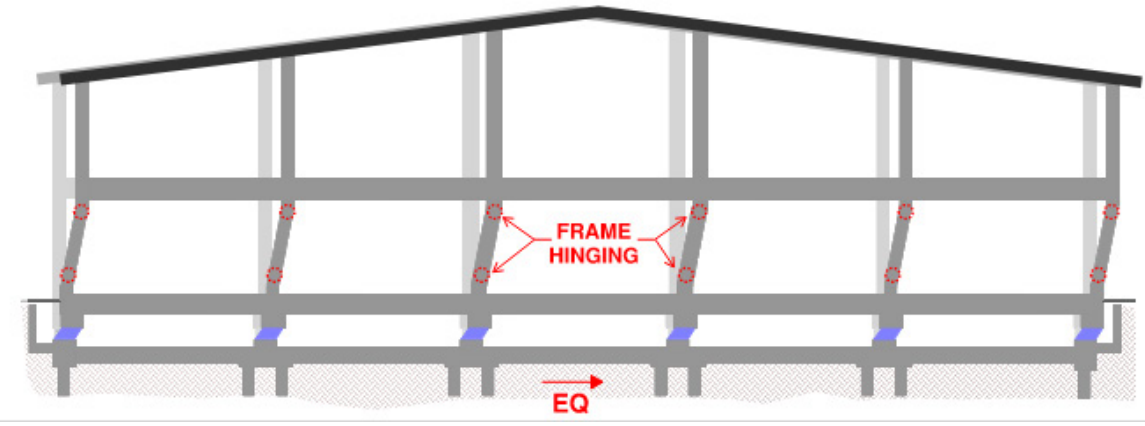
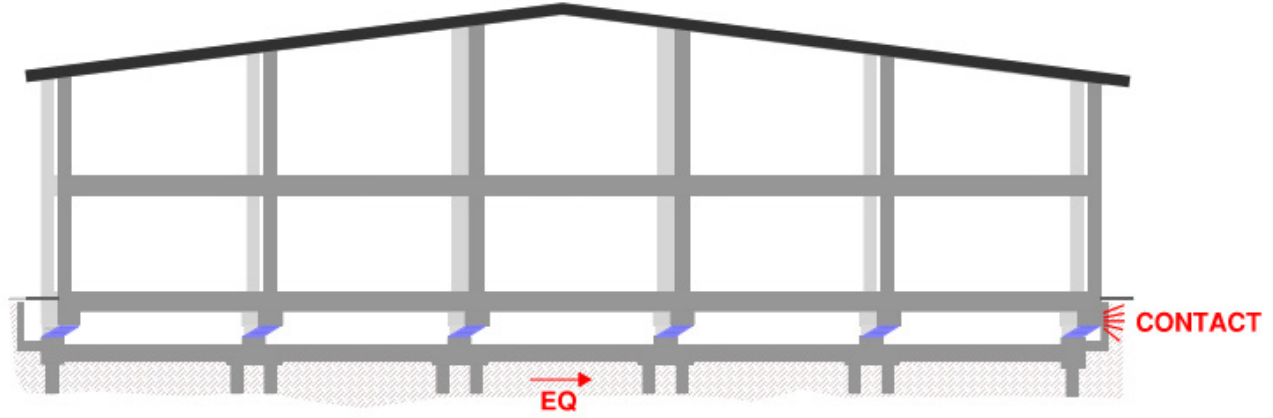
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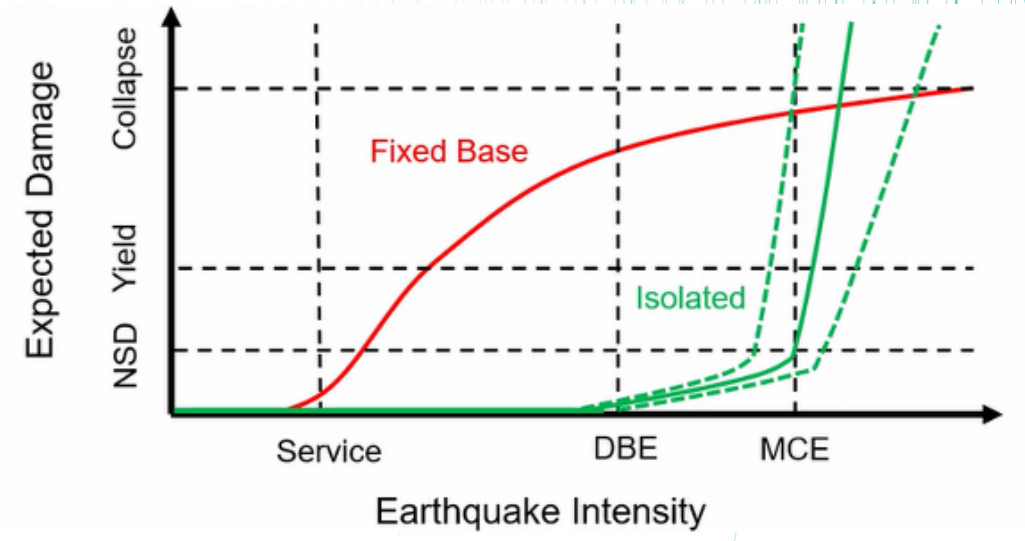
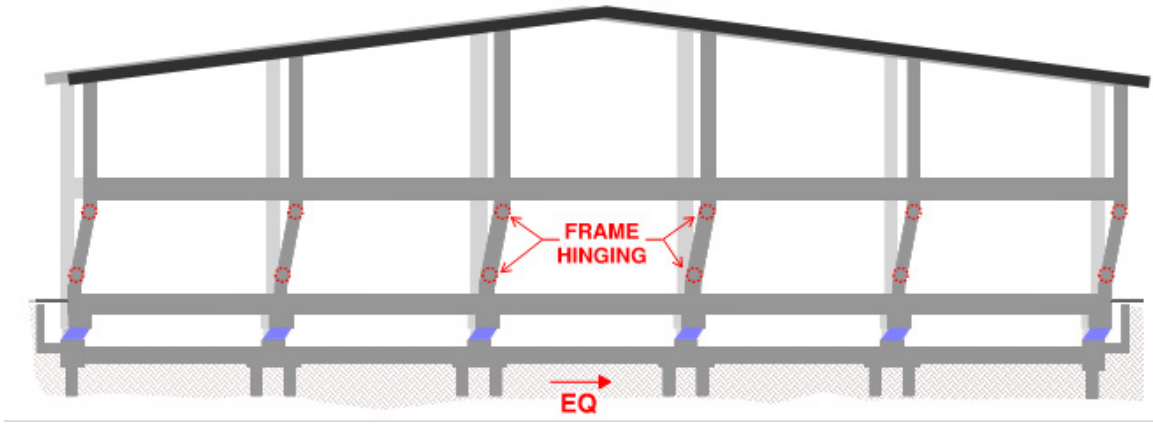
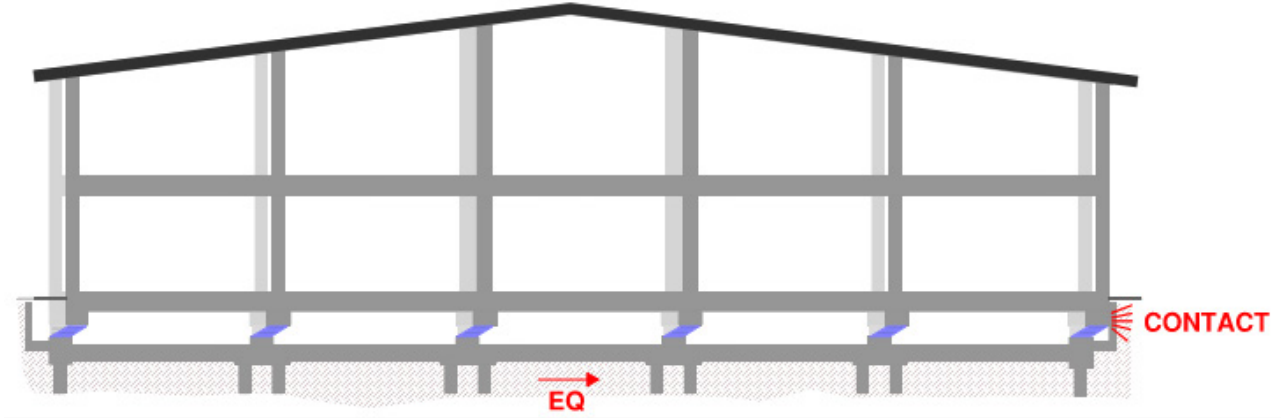


# Development of this Technical Guidance Note

- In May 2024 Health NZ facilitated a workshop involving representatives from the engineering practices that had recently been involved in assessing base isolated hospital buildings. Input was also provided by members of international research teams working on understanding moat impacts on the performance of base isolated buildings.
- This technical note captures the key points discussed at the workshop and subsequent discussions. This draft is subject to review and further development.

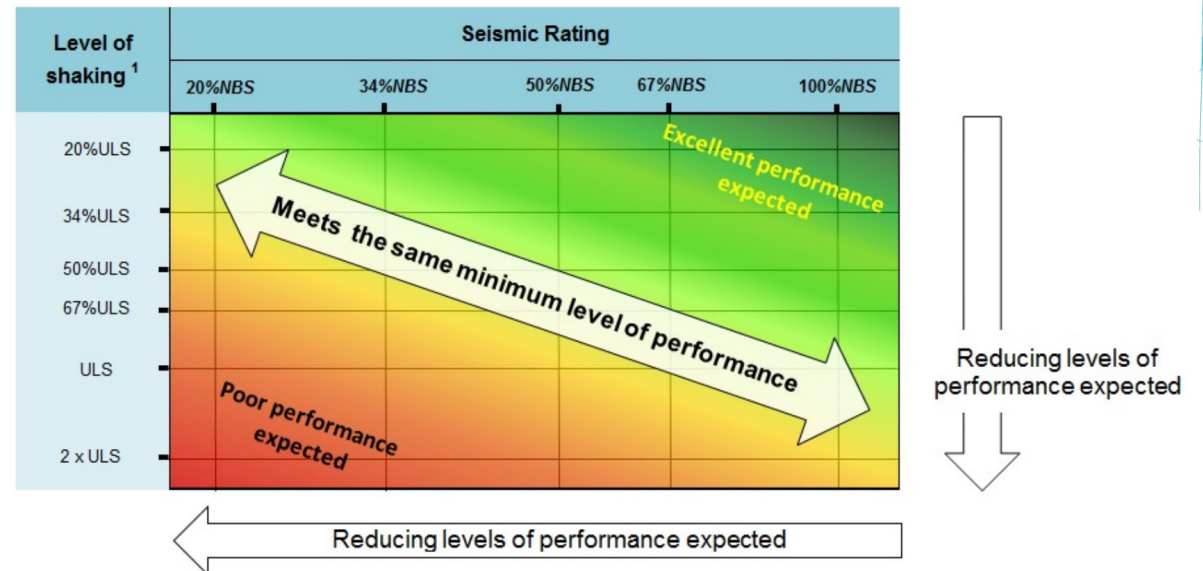




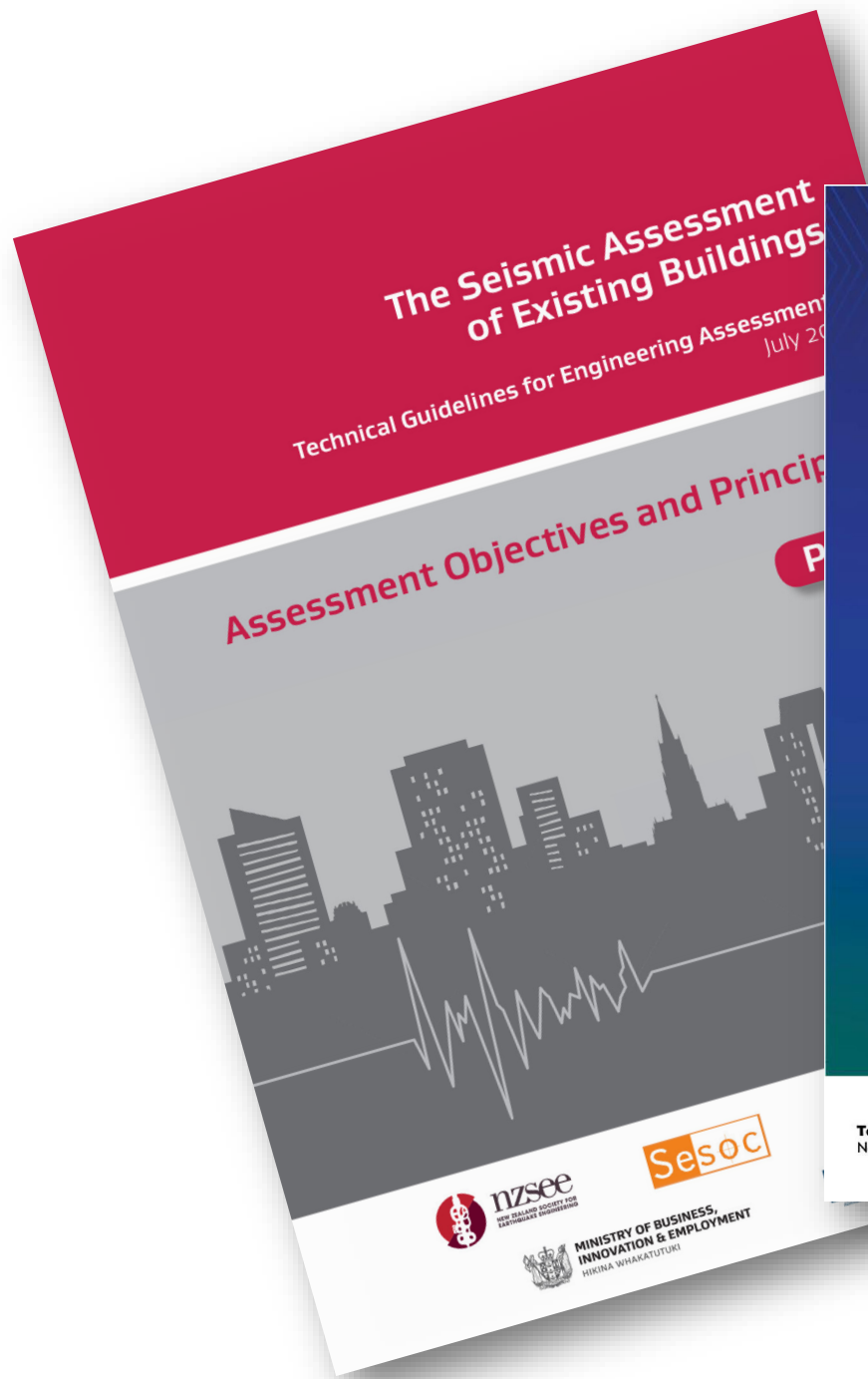


# The performance spectrum

- Good expectations in moderate to large earthquakes
- Possible poorer performance in severe (very rare) shaking
- Need to recognise both ends of this performance spectrum







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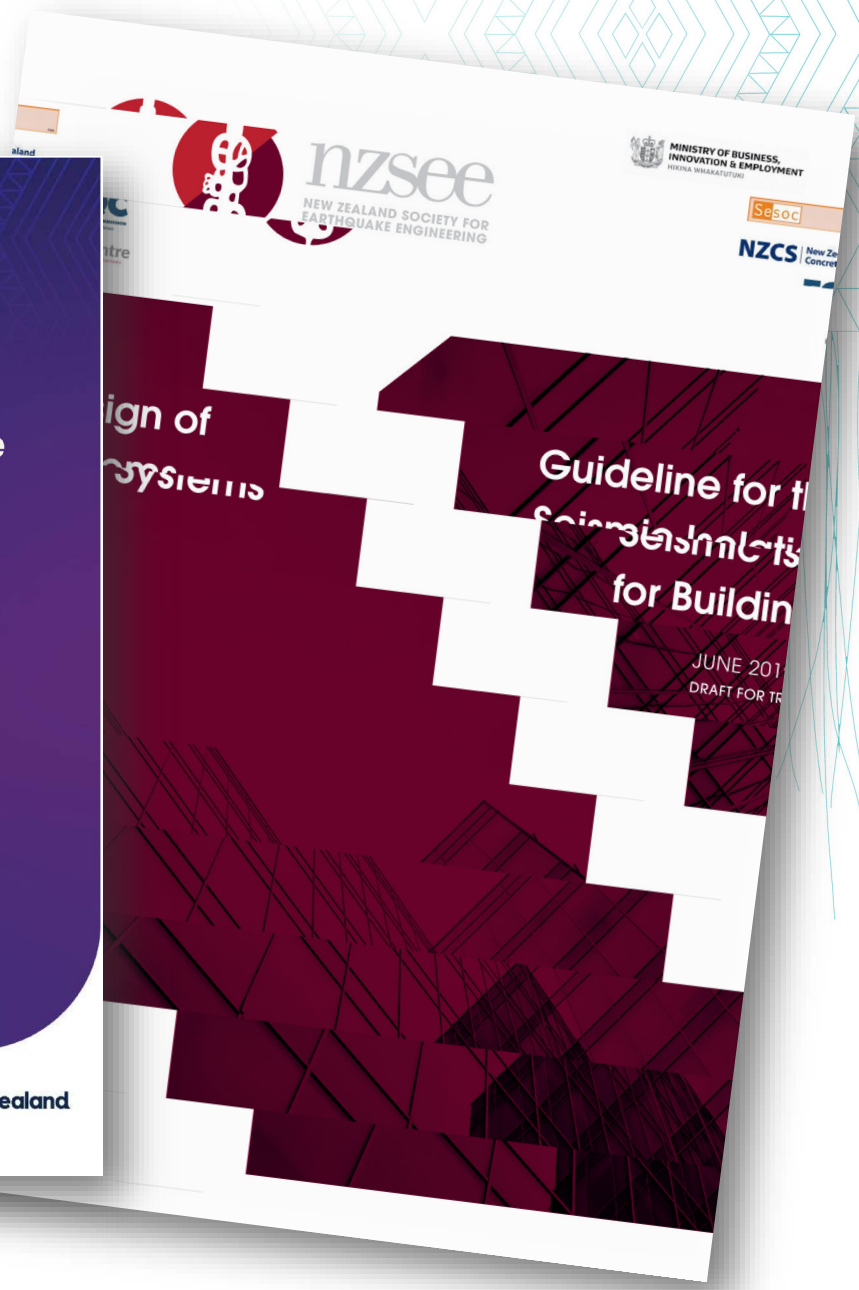
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## Appendix B: Future research needs

As noted in section 4.2, this note has been prepared following an assessment of a number of existing base-isolated hospital buildings. It expresses a stance on reasonable approaches to assessment based on currently available information and approaches.

Aspects that would benefit from further research have been identified and are listed below.

base-isolated buildings

Table 2: Future research needs related to the seismic assessment of existing base-isolated buildings

No.	Description
1	<b>Impact velocity &amp; moat wall stiffness</b> Current research indicates that, in systems where moat wall impact is a key factor in the subsequent superstructure response, impact velocity is unpredictable at impact velocities greater than 0.5-1m/s. Further research is required to determine how / if impact velocity should be accounted for in assessment, how moat stiffness influences, and if a method that estimates contact velocity in order to provide an alternative to the current approach is more robust. Further research is required to determine how / if impact velocity should be accounted for in assessment, how moat stiffness influences, and if a method that estimates contact velocity in order to provide an alternative to the current approach is more robust.
2	<b>Robustness factor, <math>\alpha</math></b> The robustness factor has been used in this guidance to represent the combination of residual displacement capacity and severity of consequences. The values are largely judgement based, and a methodology to confirm their validity. The robustness factor has been used in this guidance to represent the combination of residual displacement capacity and severity of consequences. The values are largely judgement based, and a methodology to confirm their validity.
3	<b>Future alignment with NLRHA</b> This guidance note was produced concurrently with the SESOC Design Guide for NLRHA, with consultation draft. An initial effort has been made here to extend that to isolated structures. This has considered the current provisions for NLRHA of isolated structures, ASCE 7-22 and ASCE 41-23, and personal correspondence with members of the Update Committee (PUC) issue team (developing NEHRP provisions that feed change to ASCE 7), who have advised some of the discussion points. Discussion continues regards defining 'unacceptable response' (or whether it can be ignored) and how to determine displacement demands for design (or to access against) from ground motion suites.
4	<b>Modelling contact in NLRHA</b> As a stance, this document advises against such an approach. It would be good to better understand what situations could benefit from direct analysis, and ideally in such cases having a methodology that appropriately considered uncertainty and was better suited to commercial applications (rather than research).
5	<b>Energy calculations</b> There was some discussion on these approaches at the workshop, related to assessing consequences of rattle space contact. Related to 1.
6	<b>Structural performance factor, <math>S_p</math></b> Additional research / review of appropriate $S_p$ factors is required to ensure alignment is maintained across industry guidance. As noted in the commentary to section 4.2, further critique is required around the application of an $S_p$ to the ADRS, particularly for hysteretic isolation systems which may result in an unconservative reduction in demand.

