

FP3: Addressing Earthquake-Vulnerable Buildings - A Multidisciplinary Approach

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Flagship Summary

This flagship will result in the development and validation of procedures to forecast the socio-economic impacts of building demolitions and retrofits that are legislated to occur within the coming decade. Improved assessment guidance will mitigate conservative seismic assessments that result in unnecessary demolition of existing buildings, including the country's built heritage, enabling economically-viable policy solutions. Proven cost-effective and architecturally-appropriate earthquake strengthening solutions will be developed and communicated to structural engineers nationwide so that results can be immediately implemented. Consideration will be given to the range of existing buildings posing a risk in New Zealand's cities, not just those classified as earthquake-prone by legislation.

The key thrust areas are:

1. Development of validated methodologies for detailed assessment and improvement of earthquake-vulnerable buildings such as unreinforced masonry and reinforced concrete buildings. Where possible, validation may be achieved via field testing in buildings scheduled for demolition.
2. Development of methodologies for economic assessment of options for addressing earthquake-vulnerable buildings, namely: mitigation, demolition, or no action.
3. Understanding the development of policy and initiatives regarding earthquake-vulnerable buildings, including understanding societal involvement and expectations in such policy.

Thrust Areas	Key tasks/Deliverables	Start	Finish
FP3.1 Methodologies for earthquake-vulnerable buildings	1. Develop alternative methods for improved seismic assessment of existing buildings with focus on highest life safety risks	1/01 /2016	31/12 /2019
	2. Develop and test innovative retrofit solutions for earthquake-vulnerable buildings	1/01 /2016	31/12 /2019
FP3.2 Economics of earthquake vulnerable buildings	1. Assess impacts of earthquakes and earthquake-related policies on property and rental markets	1/01 /2016	31/12 /2019
	2. Assess the utility of different financial and economic tools for decision making related to existing buildings	1/01 /2017	31/12 /2020
	3. Investigate the role of insurance in the addressing earthquake-vulnerable buildings	1/01 /2018	31/12 /2020
FP3.3 Societal perceptions and Policy	1. Investigate public understanding of earthquake risk and mitigation options and their spatial and temporal variations	1/01 /2017	31/12 /2019
	2. Investigate the role of communities of practice in shaping earthquake prone building policy at a national to local level.	1/01 /2017	31/12 /2019
	3. Develop innovative methods for community participation in the development of policies and initiatives to address earthquake-vulnerable buildings	1/01 /2018	31/12 /2020

Funded Projects

- **16014** - The evolution of New Zealand earthquake safety policy - [Ann Brower](#) and [David Johnston](#).
- **16058** - Shake table testing of simple and practical securing solutions for face loaded unreinforced masonry walls - [Dmytro Dizhur](#) and [Jason Ingham](#).
- **16012** - Quantifying the economic impact of New Zealand's earthquake-prone building policy on commercial property markets - [Olga Filippova](#).
- **16074** - Exemplar retrofits: Celebrating Success - [Jason Ingham](#) and [Dmytro Dizhur](#).
- **16075** - Stronger buildings via precinct upgrades: Understanding lessons learnt from past precinct approaches - [Vivienne Ivory](#), [Jason Ingham](#) and [Chris Bowie](#).
- **16076** - The cost of seismic retrofits: Case studies from Auckland Council - [Reza Jafarzadeh](#), [Jason Ingham](#) and [Karen McAulay](#).
- **16077** - Insurance for EQP buildings – Incentives, premiums, and contracts – [Ilán Noy](#), [Miles Parker](#), [Olga Filippova](#), [Erica Seville](#) and [John Vargo](#).
- **16008** – Where perceptions and policy meet: Understanding pathways to improving mitigation for earthquake prone buildings - [Julia Becker](#), [Temitope Egbelakin](#), [David Johnston](#), [Caroline Orchiston](#) and [Jason Ingham](#).
- **17116** - Seismic assessment of corroded reinforced concrete buildings - [Lucas Hogan](#), [Dmytro Dizhur](#) and [Jason Ingham](#).
- **17122** - Detailed seismic assessment of reinforced concrete buildings - [Jason Ingham](#), [Richard Henry](#), [Ken Elwood](#), [Nic Brook](#), and [Dmytro Dizhur](#).

- [17124](#) - An operational framework to determine the seismic resilience of New Zealand churches - [Jason Ingham](#), [Sonia Giovinnazzi](#), Tatiana Goded, and [Nick Horspool](#).
- [17092](#) - Increasing earthquake resilience: Internalising externalities through regulation and financial risk transfer tools - [Ilan Noy](#), and [Olga Filippova](#)
- [17139](#) - Improving Earthquake Resilience in Provincial Towns – A Town Centre Regeneration Approach - [Temitope Egbelakin](#), [Jason Ingham](#), Glavovic, Pawson, Corney, Dangerfield & Thompson
- [17142](#) - Safe as Houses? The Impact of the Earthquake-prone Buildings Amendment Act 2016 on New Zealand's Existing Building Stock - Hopkins, Toomey & Kipp

Related Efforts

- [Advancements in Engineering Guidelines and Standards: Seismic Assessment and Improvement of Existing Buildings](#). Part of negotiated [Natural Hazards Research Platform](#) (NHRP) project (2015-UOC-PC-01).

Video Workshop Meetings

- 16 May 2016, 11.00-12.30pm – [Webconference agenda](#) ([ZOOM Video Link](#))
- 7 June 2016 - Webconference agenda – [Webconference agenda](#) ([ZOOM Video Link](#))
- 5 July 2016 - 11.00-12.30pm – [Webconference agenda](#) ([ZOOM Video Link](#))
- 2 August 2016 - 11.00-12.30pm – [Webconference agenda](#) ([ZOOM Video Link](#))
- September 2016 - Workshop in conjunction with QuakeCoRE Annual Meeting

Other Meetings

Meetings that are outside monthly Video Workshops

Presentations

Future conference presentation slides or other material for sharing