QuakeCoRE workshop: System interactions and detailing of low-damage buildings

Objectives [See detailed QuakeCoRE proposal]

- Summarise state-of-art research related to low-damage buildings and dissipation devices.
- Catalogue and report on different types of constructed low-damage buildings.
- Identify key design and detailing approaches for constructed low-damage buildings.
- Identify design challenges and gaps in standards and guidelines for low-damage buildings.
- Develop research priorities for system interaction effects and detailing of low-damage buildings.

Workshop Summary:

The workshop was help on the afternoon of Wed 26th April in Wellington. This was planned to coincide with the NZSEE conference in Wellington (27-29th April). The workshop was held at the University of Auckland offices (Petherick Tower, 38-42 Waring Taylor St).

The workshop advertising was developed using QuakeCoRE branding and is attached to this report.

Close to 30 participants attended, including a good balance of researchers, practicing engineers, international guests, as well as representatives from key industry stakeholders (MBIE, NZSEE, SESOC). The full attendance list is included below.

The workshop included a mix of presentations and moderated panel discussions. The schedule included sessions for different types of structural system (rocking walls, slotted/sliding frames, and dissipation/braces). Each session included a high-level summary of the state-of-art by researchers followed by case-study examples from practitioners and concluded with a moderated panel discussion. The presentations and discussion focused on identify novel solutions implemented that should recommended or investigated further and the challenges and research gaps that have evolved from experiences with implementation. The final agenda is included below and the presentations have all been collated on a QuakeCoRE wiki page:

https://wiki.canterbury.ac.nz/display/QuakeCore/System+Interactions+and+Detailing+of+Low-Damage+Buildings+Workshop

Several key themes emerged from the workshop presentations and discussions. These revolved around the preservation and sharing of examples of implemented systems and prototype testing, and a greater need to focus on low-damage buildings rather than individual structural components. It was agreed to follow up the workshop with the preparation of three papers that will be published in either the NZSEE bulletin or SESOC journal:

1. System interactions (implementation examples and challenges) – Rick + Alistair
2. Prototype testing (data + protocols) – Geoff + Didier
3. Design philosophy (opinion paper for discussion) – Ken + Ron

Final agenda

Time	Topic			Speakers
1.00 – 1.15	Introduction			Rick Henry
1.15 – 1.25	MBIE low-damage guidelines			Dave McGuigan
1.25 – 1.40	Rocking wall systems (concrete & timber walls, steel frames)	State-of-art research and guidelines • Concrete • Timber		**Rick Henry**, Stefano Pampanin
1.40 – 2.20		Examples of implemented systems and detailing		
		• Alan Macdiarmid • Royal Society • Custom house • One Market Lane • College of Creative Arts	20 min	Alistair Cattanach (Dunning Thornton)
		• Southern Cross	5 min	Stefano Pampanin
		• Christ's College	5 min	Didier Pettinga (Holmes)
		• NMIT	5 min	Tony Holden (Aurecon)
2.20 – 2.50		Panel discussion		All speakers
2.50 – 3.10	Break			
3.10 – 3.25	Frame systems (sliding hinge joint, slotted concrete beams)	State-of-art research, guidelines and standards • SHJ (steel) • Slotted beam (concrete)		**Charles Clifton**, Des Bull
3.25 – 3.55		Examples of implemented systems and detailing		
		• Huddart Parker + Whitcoulls • One Market Lane	5 min	Alistair Cattanach (Dunning Thornton)
		• Christ's College	5 min	Didier Pettinga (Holmes)
		• Bellagio Apartments • Te Puni Village	10 min	Geoff Sidwell (Aurecon)
		• Lincoln Hub	10 min	Jared Keen (Beca)
3.55 – 4.25		Panel discussion		All speakers
4.25 – 4.35	Dissipative and/or braced systems (components and devices)	State-of-art research, guidelines and standards		**Geoff Rodgers**
4.35 – 4.55		Examples of implemented systems and detailing		
		• Gateway • Nelson airport terminal	5 min	Alistair Cattanach (Dunning Thornton)
		• Damper testing	5 min	Didier Pettinga (Holmes)
		• Opus HC	5 min	Will Parker (Opus)
		• Kilmore St	5 min	[not shown at workshop]
4.55 – 5.15		Panel discussion		All speakers
5.15 – 5.30	Wrap up and next steps. Three papers: - Implementation and detailing examples - Prototype testing and data - Design philosophy (opinion piece)			Ken Elwood

Participants

1. Rick Henry (UA)
2. Ken Elwood (UA)
3. Charles Clifton (UA)
4. Pierre Quenneville (UA) – [in-part]
5. Yiqiu Lu (UA)
6. Chris Motter (UA)
7. Lucas Hogan (UA)
8. Tim Sullivan (UC)
9. Geoff Rogers (UC)
10. Stefano Pampanin (UC)
11. Trever Yao (UC)
12. Pouyan Zarnani (AUT) – [in-part]
13. Greg Preston (QC) – [in-part]
14. Peter Smith (FP4 industry advisor)
15. Des Bull (Holmes)
16. Didier Pettinga (Holmes)
17. Alistair Cattanach (Dunning Thornton)
18. Geoff Sidwell (Aurecon)
19. Tony Holden (Aurecon)
20. Helen Ferner (Beca)
21. Jared Keen (Beca)
22. Will Parker (Opus)
23. Paul Campbell (Opus)
24. Dave McGuigan (MBIE)
25. Ron Mayes
26. Demin Feng
27. Keri Ryan (UNR)
28. Ying Zhou (Tongji)
29. Antonio Dicesare

Workshop coordinators who received travel support included:

- Rick Henry
- Charles Clifton
- Geoff Rodgers
- Yiqiu Lu