

Past Workshop: Large-scale structural testing

April 2021

Agenda



Time	Section	Presentations	Who
9.00 – 9.30	Morning tea provided on arrival		
9.30 – 9.35	Intro		Rick Henry
9.35 – 10.15	Past tests and experiences	ILEE concrete building test	Rick Henry
		ILEE Robust building test	Greg MacRae
		Swinburne MAST wall tests & Japan collaborative tests	Lucas Hogan
		NCREE torsional building test	Ken Elwood
10.20 – 10.35	Future research and practice needs	Concrete buildings	Santiago Pujol
		Steel buildings	Charles Clifton
		Timber buildings	Minghao Li
10.35 – 10.50		Practice #1	Stu Oliver
		Masonry buildings	Jason Ingham
		NSE	Rajesh Dhakal
10.50 – 11.05		Practice #2	Jama Borzouie
		Simulation & model validation	Reagan Chandramohan
		Practice #3	Stephen Hogg
11.10 – 11.40	Discussion	Breakout into small groups (<10) to discuss and develop ideas further.	
11.40 – 12.00		Reporting back from groups.	
12.00	Next steps		

BRBs

- Nominally Ductile Systems
- Horizontal/Vertical System Interaction
- Low cycle fatigue
- Steel beams to concrete walls
- Aftershock effects
- Column base detailing and effects (including smooth bars)
- Tension demand in non-ductile walls
- Friction - fundamental behaviour and THA modelling
- Column Stability

Diaphragms

1. FRP?

2. Testing (Size)

3. Irregular diagrams

- modelling
- load path
- strengthening

4. Maintenance/Condition of existing structure

- performance
- Assessment

5. "True" low Damage Design

NSEs:

- * Interaction betⁿ components betⁿ components & structure
- * Partnering with suppliers/designers to test new products/solutions
- * Bldg. services penetration through fire rated walls
- * Electrical/mechanical equipment operability after EQ.
- * Whole-of-building performance
- * Standardising testing of NSEs (adopting overseas standard where possible)
- * Acoustics/Smokes/thermal/air-water tightness

5 Small Town NZ

1. Centre of Stiffness
2. OK in low hazard zones

Timber, timber-steel, timber-concrete, steel-concrete

Design guide development for practical applications

Interactions between LLRS and diaphragms between different LLRS.

Quantify performance criteria for system robustness. (Life safety, damage control)

Stiffer LLRS for taller buildings mid-rise buildings

DESIGN

LOWER DRIFT LIMITS

- GATHER FIELD EVIDENCE (OF BENEFITS)
- PRODUCE SIMULATION SUPPORT (validated, verified, including life-cycle costs & benefits)
- PRESENT CASE TO ENGNZ
- IF NEEDED RUN LARGE-SCALE TESTS FOCUS ON NSE/STRUCTURE INTERACTION

Workshop April 2021

- Key topics from workshop on large-scale testing needs
 1. Buckling restrained braces (BRB)
 2. Column base detailing and effects
 3. Interactions - between different LLRS + LLRS-floors
 4. Diaphragms
 5. Irregular diaphragms
 6. Interaction between different NSE and NSE and structure
 7. Lower drift limits
 8. Develop/validate models
- Some topics covered by DT2 projects – some gaps remain