

Construction of Pres-Lam buildings

TDS Seminar – 12 October

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STIC Research consortium

Structural Timber Innovation Company Ltd

- Funding from Industry
 - CHH, NPI, PMA, BRANZ, Australia
- Matched by NZ government
 - 5 year programme
- R&D on timber buildings
 - U. Canterbury – frames & walls, eq, fire, CO₂
 - U. Auckland – long span roofs, fasteners
 - U.T.S. Sydney – floors, acoustics

Heavy timber – Wellington



Heavy timber – Auckland



LVL building - Germany



7 storey building - Berlin



7 storey building - Berlin



KLH – Katsch, Austria

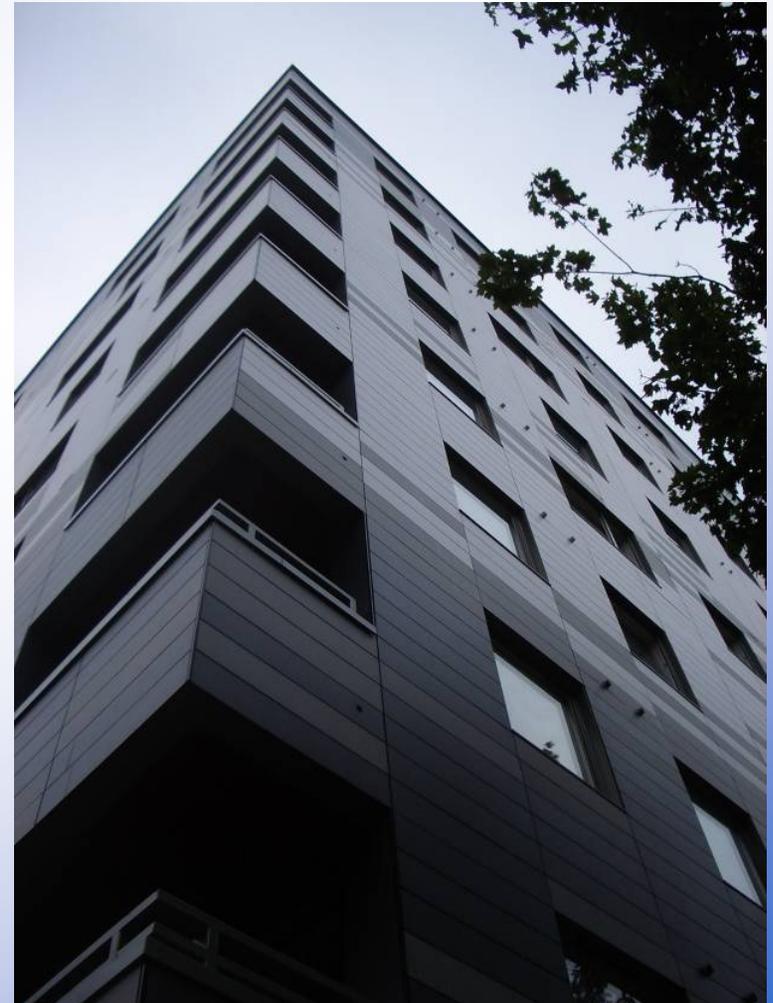


CLT: 9 storey building - London



Murray Grove, London

CLT: 9 storey building - London



Murray Grove, London

What's new in NZ ?

Post-tensioned
concrete systems
transferred to wood
LVL glued into large
beams and columns

NZ Wood

STIC

Research at
UC, UA, UTS

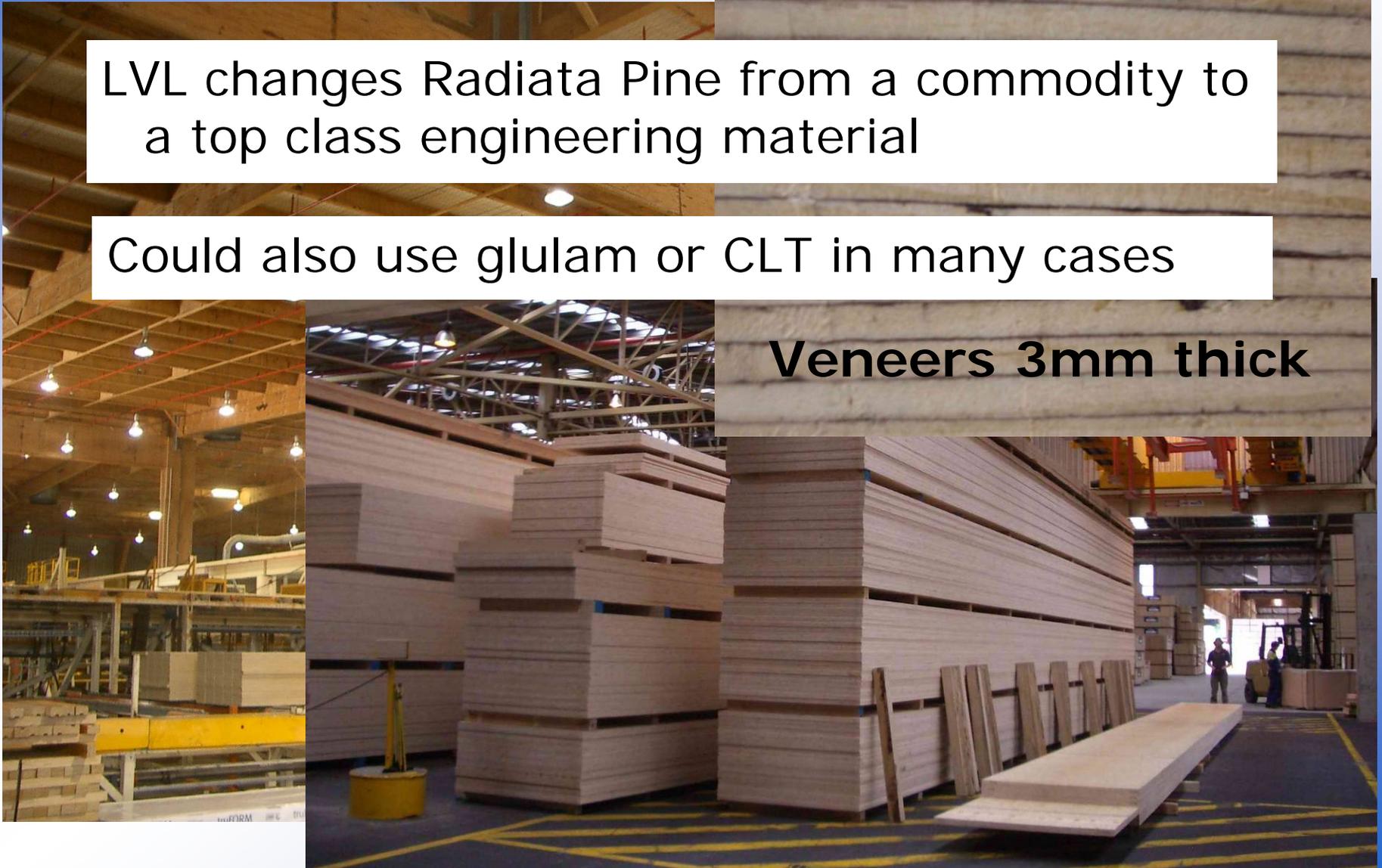


LVL - Laminated Veneer Lumber

LVL changes Radiata Pine from a commodity to a top class engineering material

Could also use glulam or CLT in many cases

Veneers 3mm thick

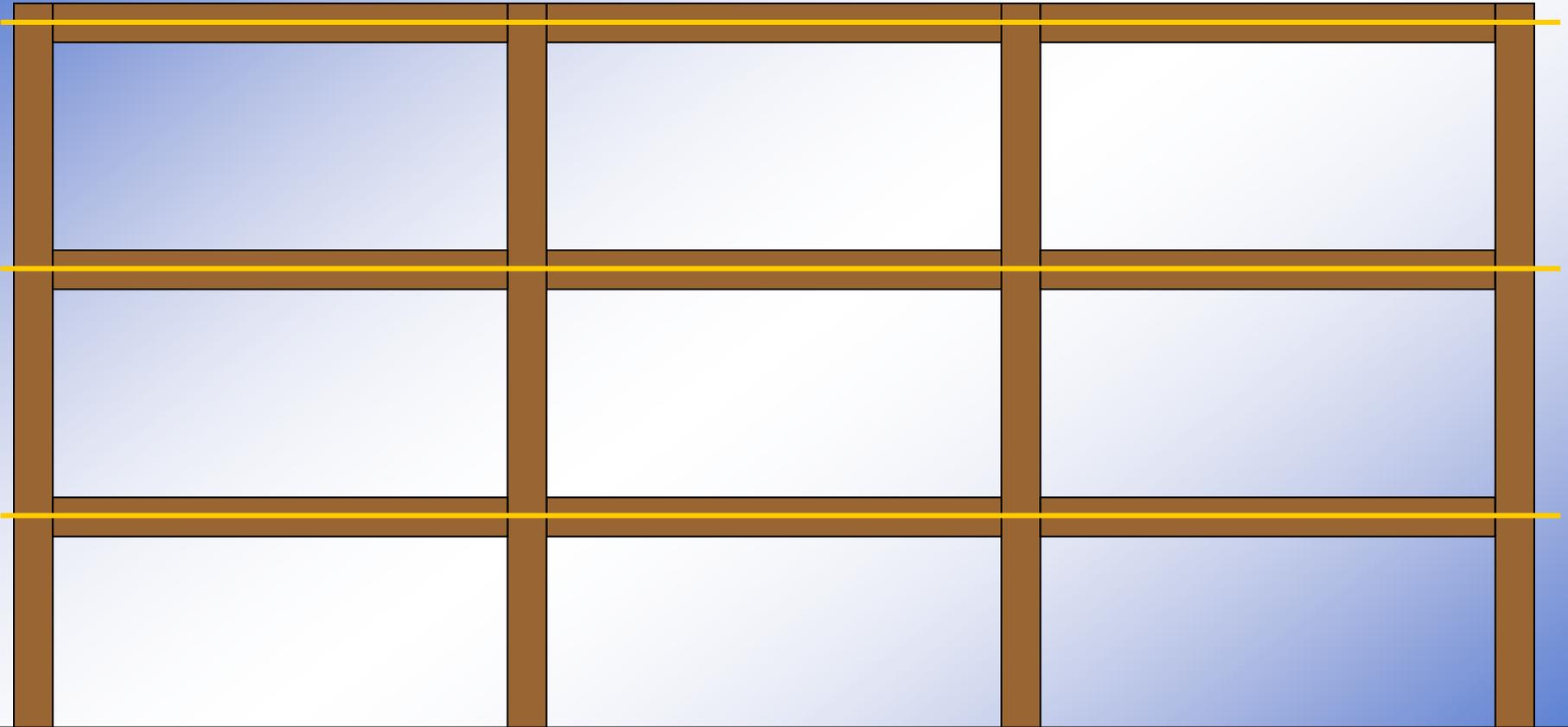


Competing with concrete

Why not do this in wood?

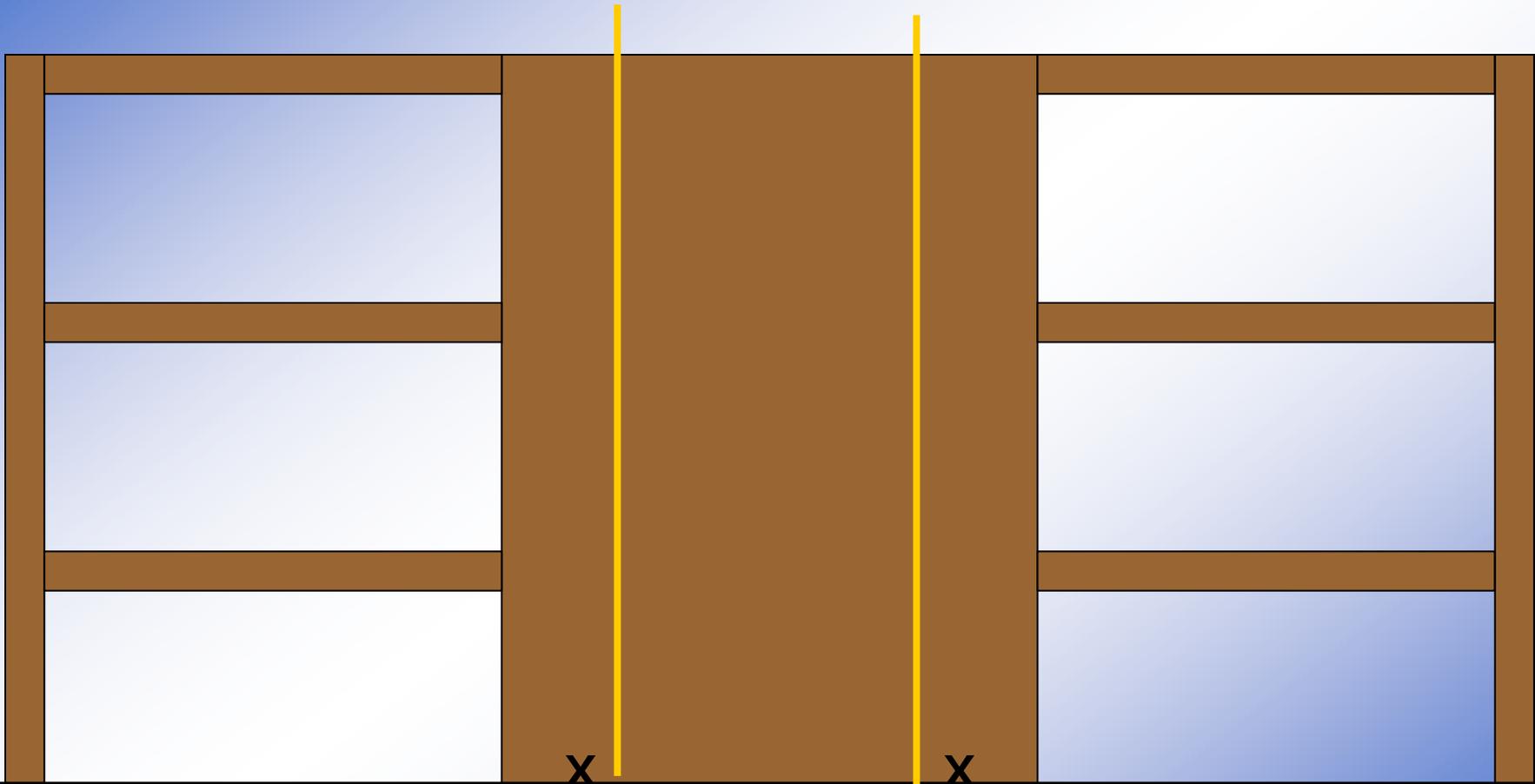


Post-tensioned timber frames



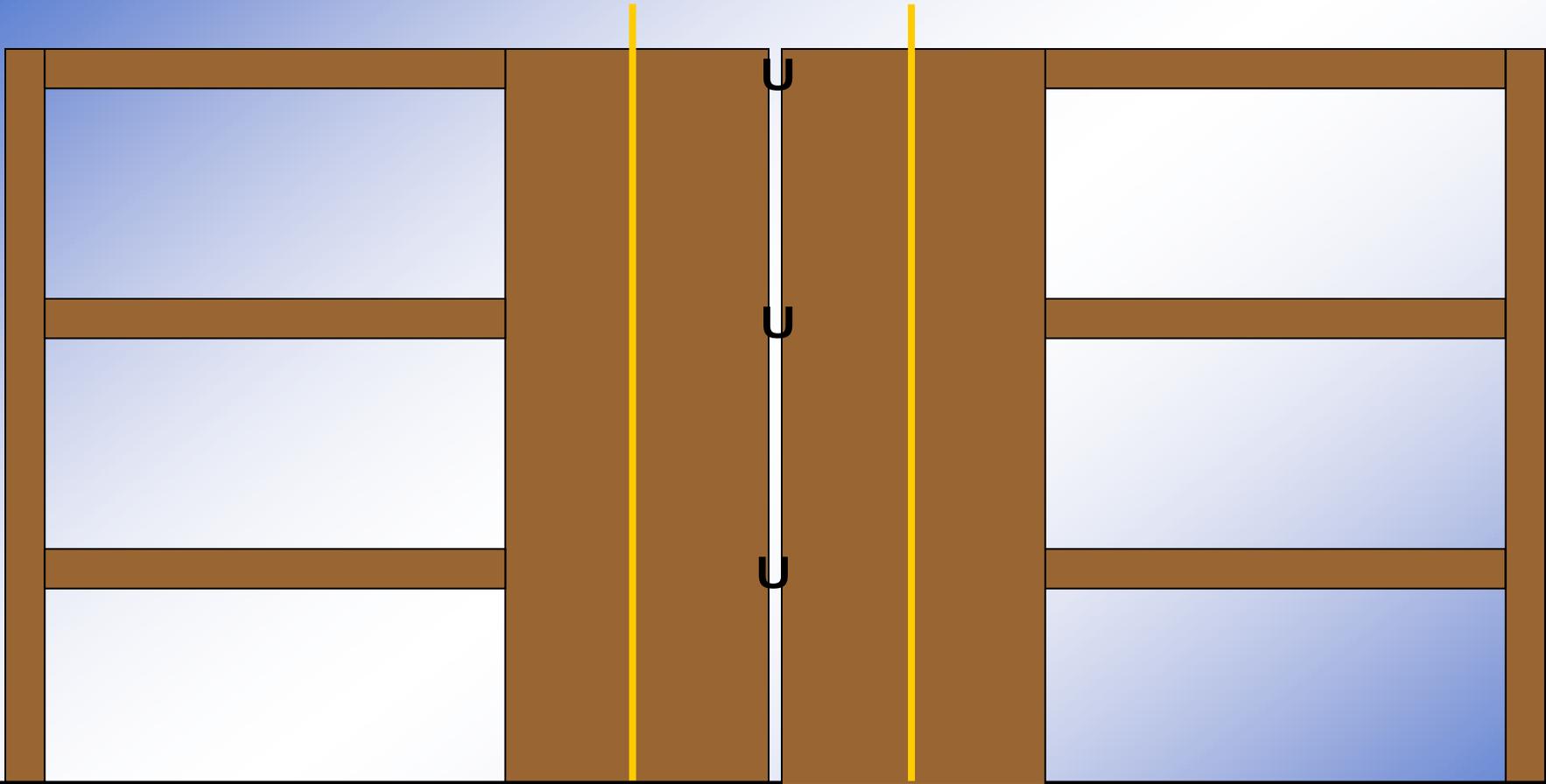
Post-tensioning solves the problem of moment connections for heavy timber

Post-tensioned timber wall



Post-tensioning solves the problem of moment connections for heavy timber

Post-tensioned timber walls



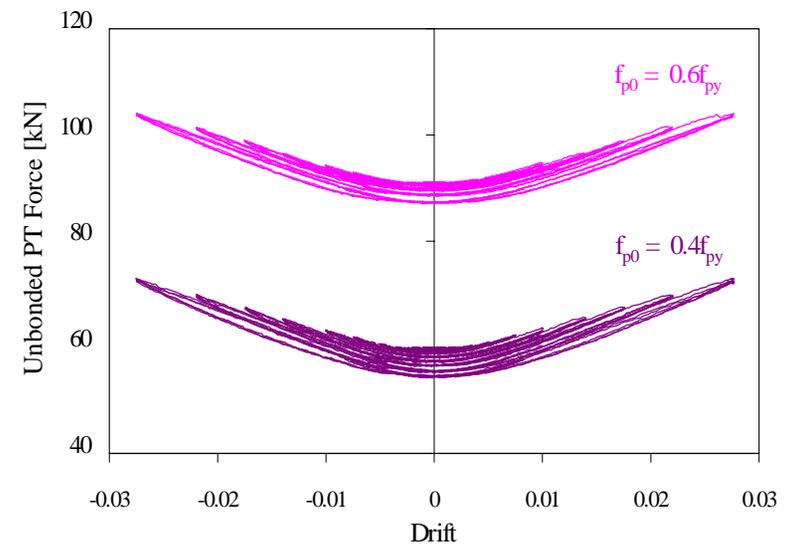
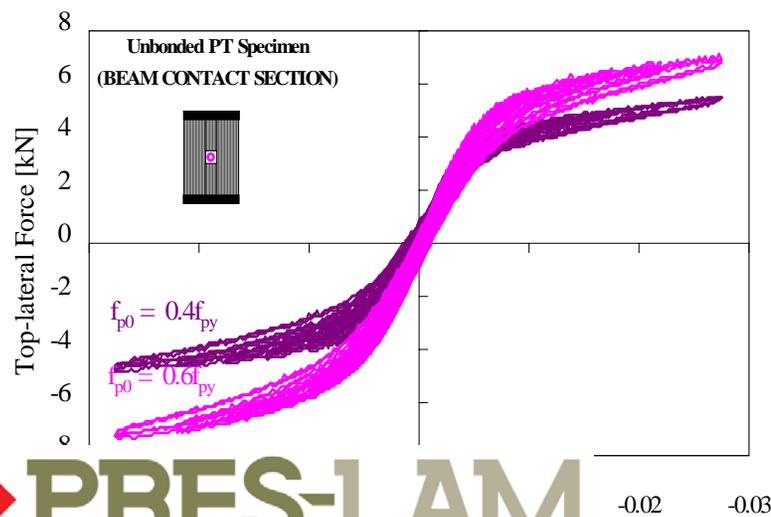
Post-tensioning solves the problem of moment connections for heavy timber

NMIT – Arts and Media building

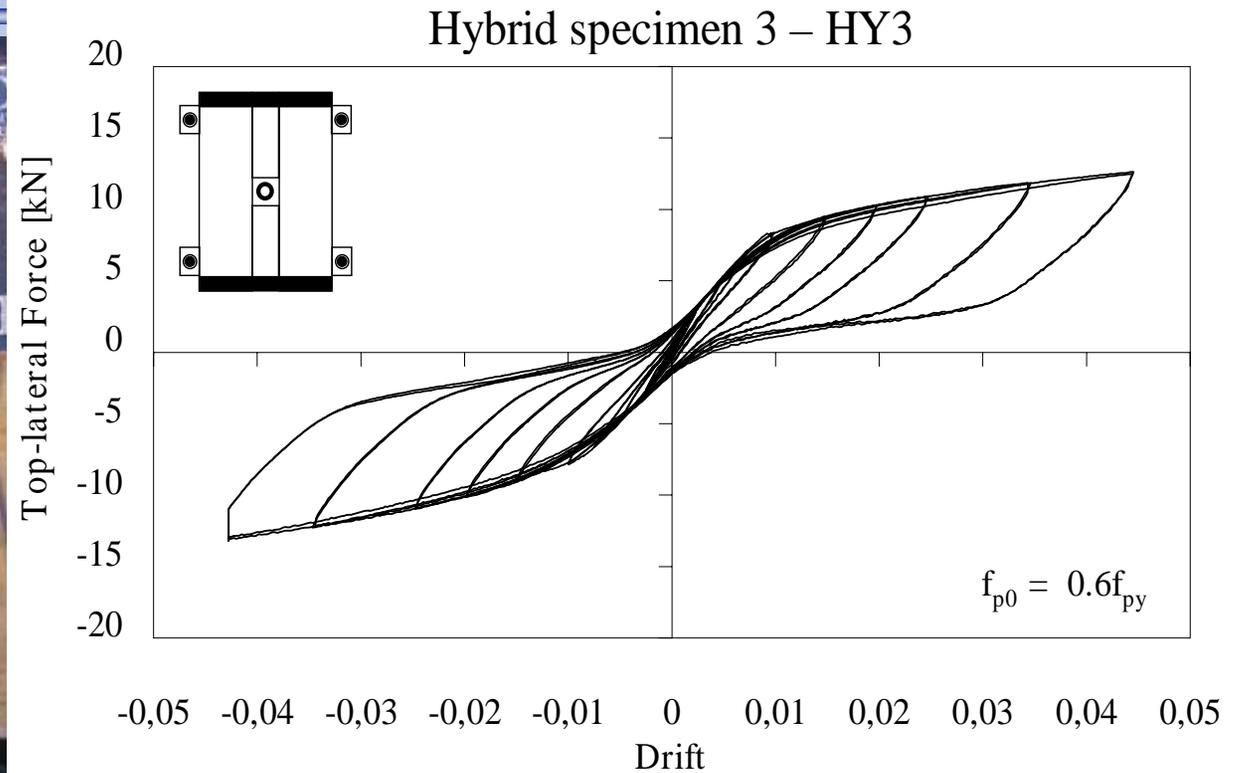
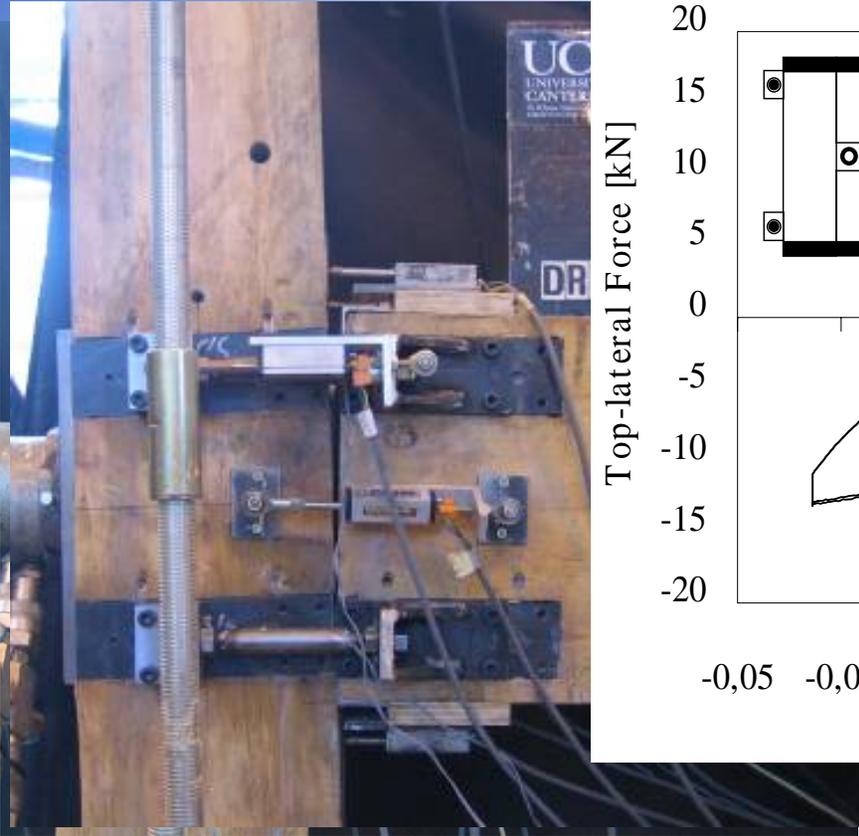


Aurecon engineers, ISJ architects

Testing at Canterbury University



Controlled seismic rocking



5-storey shaking table test



Wood-concrete composite floors



Fire safety



6 storey timber design project



Timber alternative

- Structural design
- Fire and earthquakes
- Heating and cooling
- Carbon footprint
- Time and cost

University of Canterbury Biological Sciences

Two-storey building at UC



 **PRES-LAM**

Organisations involved

- STIC
 - UC, UA, UTS
- Contractors
 - Mainzeal, BBR
- Suppliers
 - CHH, NPI
- Fabricators
 - McIntosh, Hunter
- NZ Wood

Two-storey building



 PRES-LAM

Two-storey building



Post-tensioning

↔ PRES-LAM

Two-storey building

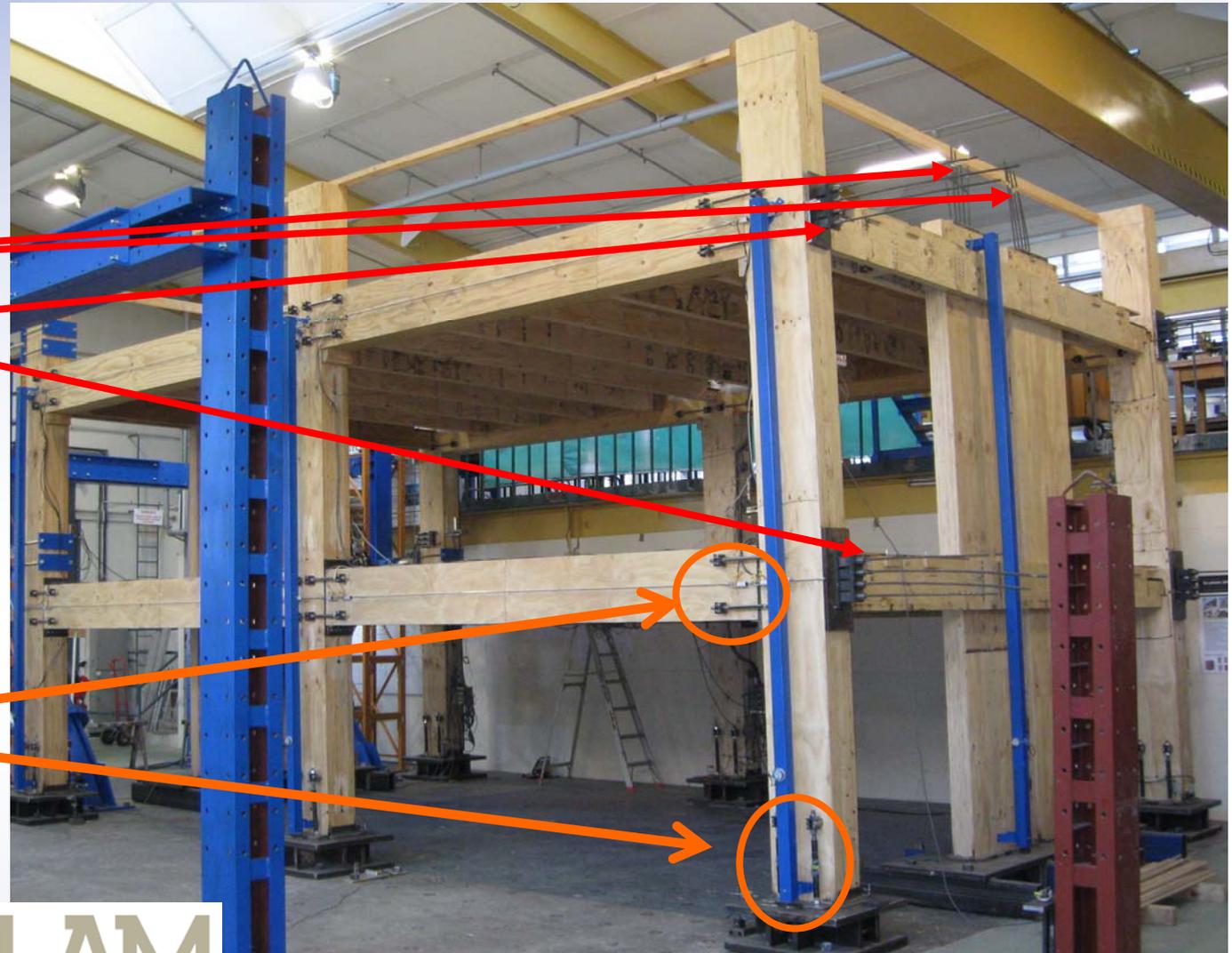
Earthquake Testing:

Frames

Walls

Post-tensioning
walls
beams

Energy
dissipation



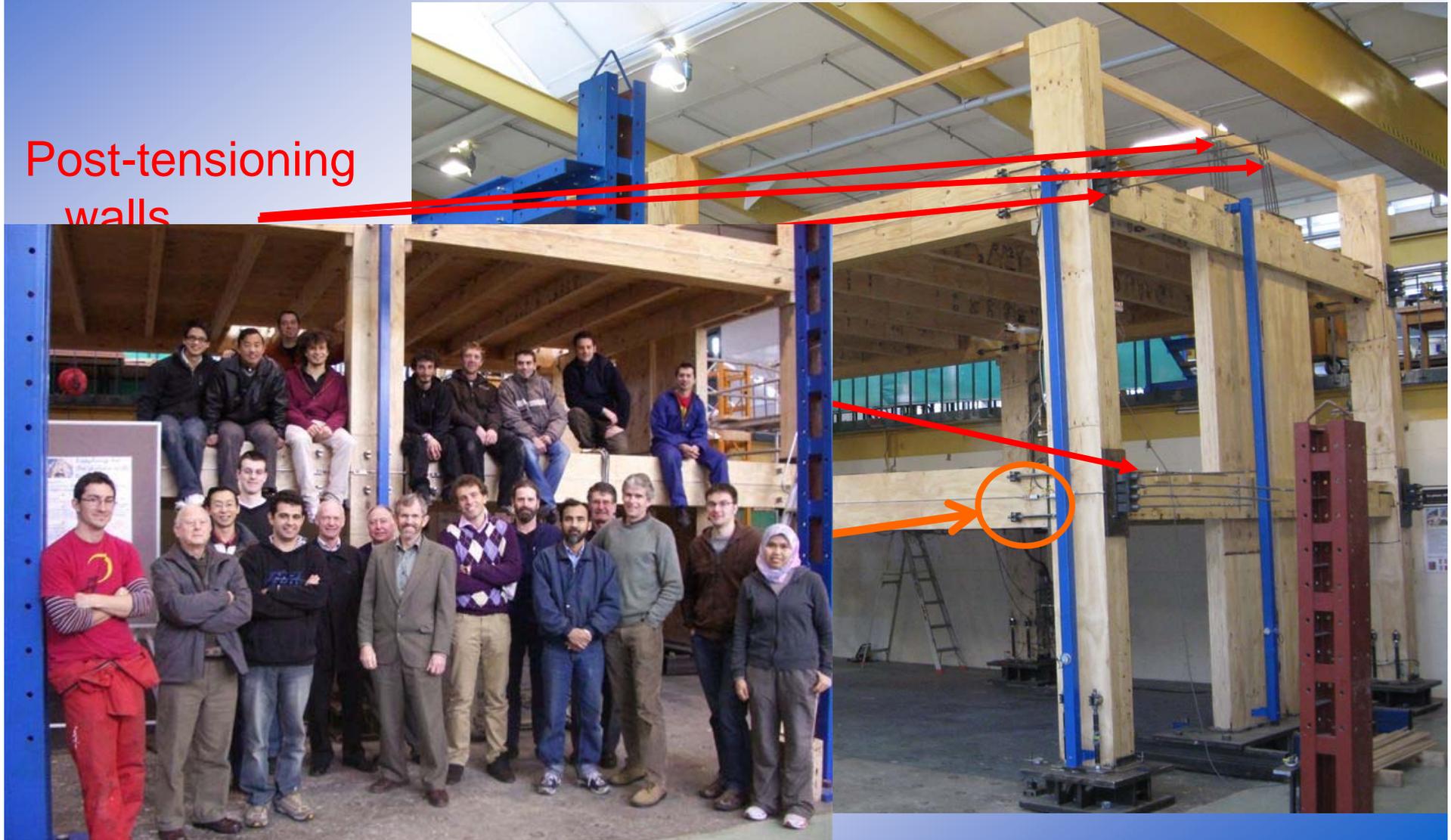
Two-storey building

Earthquake Testing:

Frames

Walls

Post-tensioning
walls



Multi-storey timber

- Rapid erection
- Light weight
- Low carbon footprint
- Earthquake resistance
- Value for money

Still to come:

- Video of construction
- Ross Copland's feedback