



Seismic Design of Core-Walls for Multi-Storey Timber Buildings

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Summary:

This paper describes options for seismic design of pre-fabricated timber core-wall systems, used as stairwells and lift shafts for lateral load resistance in multi-storey timber buildings. The use of Cross-Laminated Timber (CLT) panels for multi-storey timber buildings is gaining popularity throughout the world, especially for residential construction. This paper describes the possible use of CLT core-walls for seismic resistance in open-plan commercial office buildings in New Zealand. Previous experimental testing at the University of Canterbury has been done on the in-plane behaviour of single and coupled Pres-Lam post-tensioned timber walls. However there has been very little research done on the behaviour of timber walls that are orthogonal to each other and no research into CLT walls in the post-tensioned Pres-Lam system. This paper describes the proposed test regime and design detailing of two half-scale twostorey CLT stairwells to be tested under a bi-directional quasi-static loading. The test specimens will include a half-flight stair case with landings within the stairwell. The "High seismic option" consists of post-tensioned CLT walls coupled with energy dissipating U-shaped Flexural Plates (UFP) attached between wall panels and square hollow section steel columns at the corner junctions. An alternative "Low seismic option" uses the same post-tensioned CLT panels, with no corner columns or UFPs. The panels will be connected by screws to provide a semi-rigid connection, allowing relative movement between the panels producing some level of energy dissipation.

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