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UNIVERSITÀ
DEGLI STUDI
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LONG TERM PERFORMANCE OF POST-TENSIONED TIMBER STRUCTURES

Monday, 7 November 7, 2016, h 11.00

Room D
Via Marzolo 9, ICEA Department

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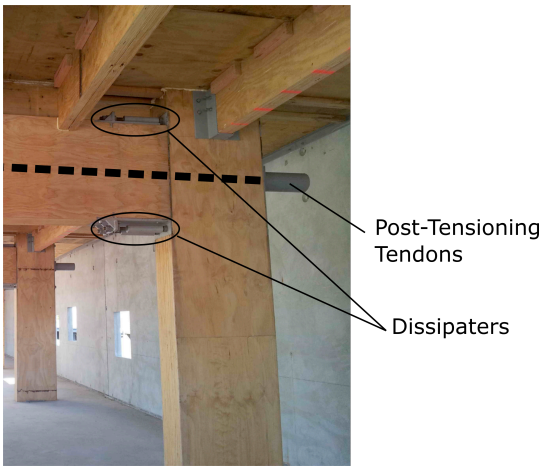
Merrit Buildign, Christchurch, New Zealand (courtesy of Andy Buchanan)



Low-damage beam-column rocking connection (courtesy of Andy Buchanan)

With the advent of new engineered wood materials such as laminated veneer lumber (LVL), glue laminated timber(Glulam) and cross-laminated timber (CLT), the interest in timber buildings has been renewed as well as its business. In this context, new technologies have been developed in order to design high performance timber buildings targeting wider spaces in terms of architectural demand.

Among these, PresLam (Prestressed Laminated Timber) technology has proved to be an efficient system to build low-damage timber structures otherwise impractical in high seismic zones. The system combines unbonded post-tensioning tendons and mild steel bars allowing the accommodation of the seismic demand through controlled rocking motion. While tendons provide re-centering capability, supplemental damping allows for hysteretic energy release.

Even if Pres-Lam technology has been spreading all over the world, there is still some uncertainty regarding its long term performance. Creep phenomena arising in timber members lead in fact to post-tensioning loss which might affect the structural response over time.

The behaviour of two specimens tested at the University of Canterbury and operative New Zealand buildings currently under monitoring is presented. Simulations considering different loss scenarios are also discussed to examine the system reliability.

Gabriele Granello

Gabriele Granello obtained his Bachelor and Master of Science in Structural Engineering at the University of Padova, in 2013. Since April 2015 he is enrolled as PhD candidate in Earthquake Engineering at the University of Canterbury in Christchurch, New Zealand, under the supervision of Prof. Alessandro Palermo and Prof. Stefano Pampanin. Gabriele's PhD is focused on the long term performance of post-tensioned timber buildings. His research includes both the monitoring of operative structures as well as numerical simulations describing the in-time seismic response.