Ductility and Overstrength of Dowelled LVL and CLT Connections Under Cyclic Loading

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Year of Publication:	2016
Country of Publication:	Austria
Format:	Conference Paper
Material:	CLT (Cross-Laminated Timber)
	LVL (Laminated Veneer Lumber)
Topic:	Connections
	Mechanical Properties
Keywords:	Ductility
	Overstrength
	Cyclic Loading
	Monotonic Loading
	Dowels
	Ductile Failure
	Brittle Failure
Language:	English
Conference:	World Conference on Timber Engineering
Research Status:	Complete
Notes:	August 22-25, 2016, Vienna, Austria p. 325-333

Summary:

This paper presents an experimental study on ductility and overstrength of dowelled connections. Connection ductility and overstrength derived from monotonic testing are often used in timber connection design in the context of seismic loading, based on the assumption that these properties are similar under monotonic and cyclic loading. This assumption could possibly lead to non-conservative connection design. Therefore, it is necessary to quantify ductility and overstrength for cyclic loading and contrast them with their monotonic performance. For this purpose, monotonic and quasi-static cyclic experimental tests were performed on dowelled LVL and CLT connections. The experimental results were also compared with strength predictions from state-of-the-art analytical models in literature that were verified for ductile and brittle failure under monotonic loading. This work also allowed investigation into a generally applicable overstrength factor for push-pull loaded dowelled connections.

Online Access:	Free

Resource Link

http://hdl.handle.net/20.500.12708/172