



Seismic Analysis of Cross-Laminated Multistory Timber Buildings Using Code-Prescribed Methods: Influence of Panel Size, Connection Ductility, and Schematization

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Summary:

This paper presents the results of an experimental study whose objective was to investigate the behavior of a hybrid wood shear-wall system defined herein as a combination of traditional light-frame wood shear walls with post-tensioned rocking Cross-Laminated Timber (CLT) panels. The post-tensioned CLT panels in the hybrid system offer both vertical and lateral load resistance and self-centering capacities. The traditional Light-Frame Wood Systems (LiFS) provide additional lateral load resistance along with a large amount of energy dissipation through the friction of nail connections. Thus, a combination of these two types of structures, in which traditional light-frame wood shearwalls are utilized as structural partition walls, may provide an excellent structural solution for mid-rise to tall wood buildings for apartments/condos, where there is a need for resisting large lateral and vertical loads as well as structural stability. In this study, a real-time hybrid testing algorithm using a combination of time-delay updating and Newmark-Beta feed forward to reduce the undesirable effects of time delay was introduced. The top two-stories of a three-story building were modeled as a numerical substructure with the first story as the experimental CLT-LiFS substructure. The experimental results of the hybrid wall are presented and discussed in this paper.

Online Access: Free

Resource Link

https://www.researchgate.net/profile/Thang_Dao4/publication/322627690_Seismic_assessment_of_a_three-story_wood_building_with_an_integrated_CLT-lightframe_system_using_RTHS/links/5a6671fd4585158bca545443/Seismic-assessment-of-a-three-story-wood-building-with-an-integrated-CLT-lightframe-system-using-RTHS.pdf