



Study on Seismic Performance of Building Structure with Cross Laminated Timber: Part 13: Relative Story Displacement of Full Scale 3-Story Model -Comparisons with Shaking Table Test

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Summary:

The material presented in this paper refers to a part of the investigation on cross-laminated (XLam) wall panel systems subjected to seismic excitation, carried out within the bilateral project realized by the Institute of Earthquake Engineering and Engineering Seismology (IZIS) and the Faculty of Civil and Geodetic Engineering at the University of Ljubljana (UL FCGE). The full program of the research consists of basic tests of small XLam wooden blocks and quasi-static tests of anchors, then quasi-static tests of full-scale wall panels with given anchors, shaking-table tests of two types of XLam systems including ambient-vibration tests, and finally analytical research for the definition of the computational model for the analysis of these structural systems. In this paper, the full-scale shaking-table tests for one XLam system type (i.e. specimen 1 consisting of two single-unit massive wooden XLam panels) that have been performed in the IZIS laboratory are discussed. The principal objectives of the shaking-table tests have been to get an insight into the behavior of the investigated XLam panel systems under seismic excitations, develop a physical and practical computational model for simulation of the dynamic response based on the tests, and finally correlate the results with those from the previously performed quasi-static tests on the same wooden panel types. The obtained experimental results have been verified using a proposed computational model that included new constitutive relationships for anchors and contact zones between panels and foundations. Because a reasonable agreement between the numerical and experimental results has been achieved, the proposed computational model is expected to provide a solid basis for future research on the practical design of these relatively new materials and systems.

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Resource Link

https://www.researchgate.net/profile/Viktor_Hristovski/publication/258108112_Full-Scale_Shaking-Table_Tests_of_XLam_Panel_Systems_and_Numerical_Verification_Specimen_1/links/5589436508ae9076016e9999.pdf