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ABSTRACT OF THE DISSERTATION

*„Hybrid Timber Building Structures of Mass Timber and Light Timber Frame Panels –
Proposed Solutions and Evaluation of Their Effectiveness.”*

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In recent years, timber construction has been gaining popularity, necessitating the search for new solutions to ensure timber structures can be used in a manner closer to optimal and appropriate for the expected functionality. This study aims to analyze and evaluate the potential of hybrid timber constructions that combine mass timber with a light timber frame.

The study examines existing timber constructions, both homogenous and hybrid timber, as well as mixed hybrids where timber is combined with other materials such as steel and reinforced concrete. Based on this analysis, the main limitations of mass timber and light timber frame constructions were identified. Subsequently, new hybrid timber construction solutions were proposed, potentially overcoming these limitations.

Various variants of homogenous and hybrid timber floor constructions were analyzed in two modular grids (8.1 x 8.1 m and 5.4 x 5.4 m) and hybrid timber stiffening cores consisting of light timber frame panels embedded in mass timber frames. The calculations were performed using the standard method by Eurocodes and the Finite Element Method. Potentially suitable hybrid timber solutions were found in the 5.4 x 5.4 m grid, as well as hybrid timber stiffening core solutions that could be applied in buildings with more than two floors while maintaining open floor spaces.


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