



Experimental and numerical investigations of two-way LVL–concrete composite plates with various support conditions

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Timber-Concrete Composite

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Summary:

Design of modern timber floors is often governed by the vibration serviceability requirements. One way to improve vibration serviceability is through the design of two-way floor systems. In this paper, the behaviour of two-way LVL–concrete composite plates and a plate strip is investigated experimentally, with an emphasis on the performance of proposed dovetail joint for connecting the adjacent LVL panels. The investigations consist of the experimental modal analysis and static load deformation tests, performed under multiple support conditions. The results show a significant two-way action, indicated by about 45% higher fundamental natural frequency when four edges are supported instead of two. The point load deflection in the centre of the plate was reduced of about 9%. Furthermore, a numerical model for two-way TCC plates was developed and results show a wide agreement with the experimental behaviour, except for discrepancies related to deflections on the plate edge. The results from the experimental and numerical investigations indicate that the dovetail joint can produce a stiff connection, such that the LVL layer could be regarded as continuous in the connected direction.

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