



Performance of Notched Connectors for CLT-Concrete Composite Floors

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Summary:

CLT-concrete composite floor systems are a solution for timber buildings with a long-span floor. It yields a reduction of carbon footprint and even eco-friendly structure at the end of its service life. This study will evaluate the structural performance of notched connectors in the CLT-concrete composite floor, comprised of the serviceability stiffness, maximum load, and behavior at failure. The parameters of the test plan are the loaded edge length, the notch depth, the concrete thickness, and the screw length. Other secondary variables are also assessed, such as different loading sequences, speed of test, and timber moisture content. Experimental results prove that the performance of the connector depends significantly but not linearly on the notch depth and the length of the loaded edge. The connector with a deeper notch and a shorter heel will be stiffer and more robust, but it also tends to have a brittle rupture. The test results also help validate a solution for deconstructable connector systems. A nonlinear finite element model of the connector is built and validated versus the experimental results. It yields reasonably good predictions in terms of resistance and can capture the load-slip relationship.

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