



Seismic Shaking Table Testing of a Reinforced Concrete Frame with Masonry Infill Strengthened with Cross Laminated Timber Panels

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Summary:

This paper deals with the issue of seismic strengthening of existing older reinforced concrete frame buildings. A new method of strengthening by applying a new outer shell made of cross laminated timber (crosslam or Xlam) plates is presented. A seismic strengthening case study is presented on a 3 story reinforced concrete frame building. The results of shaking table tests of a (strengthened) two-story reinforced concrete frame with and without infill are presented. The proposed retrofit system employs a new outer cross laminated timber jacket to stabilise a building against horizontal shear forces that are caused by earthquakes; on one hand the timber panels have a low mass and therefore don't contribute much to seismic forces, however they are very stiff on the other hand and provide high shear resistance. The new outer shell could have windows, doors and a façade installed already in the manufacturing plant. Another positive aspect of the outer shell is that there are no harsh interventions to a building and that people don't have to move out during the construction phase (unlike when using most of the conventional methods for seismic strengthening). On the other hand the installation of panels is also possible from the inside with little influence on the existing structure. All together it makes a unique system that prolongs the lifespan of constructions, contributing to sustainability. In the following chapters the system is presented more in detail as well as the results from dynamic shaking table tests of a reinforced two-story RC frame with masonry infill.

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