

Session ID: ASR-8

Title

USE OF TIMBER FOR THE SUSTAINABLE EARTHQUAKE PROTECTION OF EXISTING BUILDINGS

Convenors

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Description

In many countries, the heritage building stock is largely comprised of masonry buildings with timber roofs and floors. These structures have proved vulnerable to seismic loading, with the dynamic response strongly influenced by the diaphragm in-plane deformability and the connections' quality. Understanding the behaviour of timber diaphragms and their interaction with the load-bearing walls is therefore critical.

The characteristics that qualified timber as the optimal choice for building diaphragms in the first place (lightness and strength) make it suitable also for strengthening existing buildings and reducing their vulnerability. Such a concept is not new, as the examples of traditional technologies that by combining wood with other materials, have proven successful in surviving strong earthquakes are many (Himis, Dhajji Dewari, Gajola Pombalina). Following that example and taking advantage of the development of new timber-based products (GLT, LVL, CLT), using timber for retrofitting existing structures has caught the interest of researchers.

In this framework it is worth mentioning the activity of the ReLUIS university consortium and the Joint Research Centre of the EU Commission (project NOTICEUB), where strong attention is given to dry, reversible and minimally invasive interventions that can be integrated with strategies to improve energy efficiency and promote sustainability. Under such a perspective, the renewable nature of wood and the prefabrication typical of timber constructions have favoured new timber-based retrofits targeting existing i) wooden roofs and floors, ii) masonry walls, iii) reinforced concrete structures.

The flourishing of timber-based techniques requires solid experimental background, as testified by testing carried out in international programs such as the Transnational Access of ERIES.

This session aims to provide an overview of the state-of-the-art on all aspects of using timber in retrofit interventions, focusing on its sustainability.

Invited Speakers

J. Branco ⁴, J. Ingham ⁵, H. Derakhsan ⁶, M. Mosoarca ⁷, J. Paul Smith-Pardo ⁸, M.R. Valluzzi ⁹, A. Marini ¹⁰, I. Calì ¹¹, V. Rajcic ¹², X. Song ¹³

Affiliations

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