Special session title: Challenges and future trends on the assessment and retrofitting of infilled reinforced concrete structures

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Most of the buildings located in seismic-prone regions were designed before the enforcement of current seismic regulations and with no modern concepts of seismic-resistant detailing philosophies. Thus, the structural safety of these buildings may not be satisfied when subjected to seismic actions, but it could also hamper any refurbishment investment in the case of an earthquake. Replacing the existing buildings with new ones is prohibitively expensive and has a substantial environmental and social impact.

Nowadays, the sustainable renovation of the existing infilled reinforced concrete buildings is typically addressed, focusing only on reducing the operational energy consumption and using low-carbon materials in the refurbishment process. The structural deficiencies are not eliminated, leaving the building seriously unsafe despite the investment, particularly in seismic prone regions. Independent seismic or energy retrofitting techniques are available and are usually adopted. More recently, some others are being proposed to simultaneously assume a holistic approach to increase seismic safety and energy efficiency.

Also, different methodologies have been developed to assess the buildings' seismic vulnerability. Novel methods are being proposed towards a global performance assessment in which various indicators are combined at once (e.g. energy efficiency, life cycle, among others).

This special session comprises presentations and a concluding round-table discussion. The topics of the Special Session will cover, but may be not limited to: performance assessment methodologies; experimental and numerical studies on the seismic behaviour of masonry infill walls; independent or integrated retrofit techniques of reinforced concrete frames structures; regional or national impact assessment of implementing retrofitting strategies.