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APPLIED ELEMENT MODELLING FOR SEISMIC ASSESSMENT OF MASONRY BUILDINGS WITH FLEXIBLE ROOFS

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Masonry construction is one of the most vulnerable typologies under seismic action, as evidenced in past earthquakes [1,2] (Murty *et al.*, 2012; Rai *et al.*, 2016). However, masonry buildings are built around the world due to its affordability and durability, including critical facilities such as schools. Several features are developed to improve seismic performance of ordinary masonry buildings, such as confining the masonry panels with reinforced concrete elements [3] (Meli *et al.*, 2011). This paper investigates lateral capacity of non-engineered ordinary and confined masonry school building typologies with flexible diaphragms found in developing countries such as Nepal and India.

A novel modelling approach based on the Applied Element Method (AEM) [4] is employed for nonlinear pushover analysis on such buildings, by applying monotonously increasing ground acceleration method for pushover analysis. Suitable engineering demand parameters are considered for assessment of lateral capacity through this analysis. The paper presents validation of the method and seismic failure mechanisms, capacity curves, and damage states of ordinary and confined masonry school buildings.

This method could be extended to other masonry typologies and is particularly useful for seismic assessment of non-engineered masonry buildings with flexible diaphragms, usually found in the Himalayan belt, in their original as well as retrofitted condition.

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