Understanding the cyclic response of RC walls with setback discontinuities through a finite element model and a strut-and-tie model

Massone, Leonardo M.

Manríquez, Ignacio

Díaz, Sebastián

Rojas, Fabián

Herrera, Ricardo

Slender RC walls are often used in Chile and commonly, due to architectural constraint, the length of walls increases (setback) between floors designated for parking space and upper floors. These types of elements are commonly called flag walls. In this research, the behavior of slender reinforced concrete walls with a constant axial load and a cyclic lateral displacement is numerically studied, in order to compare the results obtained with previous tests. Two different model alternatives are considered: a finite element model and a strut-and-tie model. The selected models allow understanding local response, as well as, distribution of internal forces, which is also relevant information for wall design and detailing. The studied finite element model, based on quadrilateral elements with 3 degrees of freedom per node (2 translational and 1 rotation) and a model of smeared reinforced concrete material based on a rotating angle approach, is able to correctly c