Numerical Analysis of Response of T-Shaped RC Shear Walls under Biaxial Loading

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ABSTRACT

Nowadays one of the techniques to increase the lateral load capacity and structural stiffness of high-rise buildings is by using Reinforced concrete (RC) structural walls. According to former researchers, the lateral load capacity of the structural walls is influenced by the interaction between its weak and strong axis. In this study, it was done a pushover analysis to comprehend the behavior of T-shaped RC walls under biaxial loading.

LS-DYNA was used to simulate different scenarios in which the model had out-of-plane deflections on the weak axis with drift ratios of 1%, 2%, 4%. Then a monotonic load of 5% was included on the strong axis. It was possible to realize a comparison between the response of uniaxial and biaxial loading.

The results indicate that a major factor on the behavior of T-shaped wall subjected to biaxial loading was the tension in the flange. It was observed that the increase in the axial load significantly decreased the lateral load capacity. On the other hand, an increase in the width of the flange only caused minor decrease in lateral load capacity.

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