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## Experimental study of opening effects on mid-span steel plate shear walls

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This article examines the theoretical and experimental aspects of specific types of tensile-braced mid-span steel plate shear walls and the effects of circular opening on the system. The mid-span implementation of shear walls is meant to avoid the need for strengthening the surrounding principal columns. This study was conducted on a rigid frame. The shear wall system is designed and manipulated in the middle of the frame and the bearings are modeled on that in detail. A related system was made in the laboratory scale 80×80 cm and cyclic loading is applied to the system. Cyclic loading is gradually applied with a hydraulic jack, considering fully the amount of allowable and final drifts by evaluating the amount of strain and displacement of critical points by installed strain gauges and LVDTs. The results indicate appropriate and acceptable behavior of the system even in high levels of drift. Finally, the model was designed on the basis of the finite element method to authenticate the experimental results that confirm the system's efficiency.

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