

عنوان مقاله:

Steel Building Lateral Behavior under Different Bracing Configurations and Arrangements: A Numerical Study

محل انتشار:

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نویسندگان:

S. Javad Vaziri - *M.Sc. Student of Structural Engineering, Department of Civil Engineering, Semnan University, Semnan, Iran*

Mohammadreza Mofidi - *B.Sc. Student of Civil Engineering, Department of Civil Engineering, Shahid Bahonar University of Kerman, Kerman, Iran*

Atefeh Soleymani - *Ph.D. Candidate of Structural Engineering, Department of Civil Engineering, Shahid Bahonar University of Kerman, Kerman, Iran*

Hashem Jahangir - *Assistant Professor, Department of Civil Engineering, University of Birjand, Birjand, Iran*

Mojtaba Khosravi Zadanbeh - *M.Sc. in Structural Engineering, Department of Civil Engineering, University of Birjand, Birjand, Iran*

خلاصه مقاله:

Severe lateral displacement can significantly contribute to the formation of fractures, resulting in structural damage. Damage to the structure will reduce its performance. Taller buildings, such as high-rise buildings, display more significant lateral displacement. Structural bracing is a popular method for reducing lateral movement. It increases the structure's rigidity and stability. Previous research has demonstrated that the arrangement of building bracings influences seismic behavior. However, seismic design regulations do not consider this fact. This research was divided into two portions. The first section modelled a ۲۰-story structure with four variations of X-shaped, Λ -shaped, V-shaped, and two-story X-braced. The stiffness and displacement of structures equipped with each of these bracing were then measured and compared. The bracing with the highest rigidity and lowest displacement was then chosen. The brace with the better acceptable behavior in the first portion was picked for the second part. These bracing were then put through nine distinct configurations. Finally, the best arrangement was chosen. The results demonstrate that the X-shaped brace is stiffer than the Λ -shaped, V-shaped, and two-story X braces, while the V-shaped brace is the least stiff. Furthermore, it was shown that placing braces in the middle of the plan yielded the most remarkable results when compared to the other arrangements.

کلمات کلیدی:

Buckling restrained brace; Steel; Centrically braced frames; Stiffness; Story displacement

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