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INVESTIGATION OF SEISMIC BEHAVIOR OF ECCENTRICALLY STEEL FRAME WITH VERTICAL FUSE WITH SINUSOIDAL AND TRAPEZIODAL SHEETS IN DIFFERENT THICKNESSES

Alireza KASHANI
M.Sc. Graduate, Islamic Azad University, Gonbad Kavoos, Iran
alirezakashani98@gmail.com
Alireza GERAILI
Assistant Professor, Islamic Azad University, Gonbad Kavoos, Iran
arg110@gmail.com
Azim TAGHOLI
Teacher, Islamic Azad University, Gonbad Kavoos, Iran
azimtagholi@gmail.com

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Concentric braced frames have a good stiffness; however, they are deprived of proper ductility. Eccentrically braced frame (EBF) are actually an appropriate combination of moment frames and concentric braced frames, which both have simultaneously the stiffness and ductility property in a desirable manner. The essential contribution of absorbing and dissipating the energy induced by the earthquake in this type of structural systems is provided by the link beam. Considering that the connection of the link beam to the column tolerate large and varying forces and elastic deformation of moment connection, it is of necessity to design, control and provide a suitable method for improving the required ductility of these connection. Eccentric bracings with vertical links, if properly designed, can have high energy absorption and ductility and stability cyclic curve in addition to proper stiffness. For this purpose, the modeling will be done by Abaqus software. There are 15 different link types defined in the software that include various thicknesses and three types of sheets with flat, sinusoidal and trapezoidal shapes.

Figure 1. Model loading sample.

The samples were loaded with Bam earthquake time history and the nonlinear time history analysis was done. The results indicate that vertical links function properly in the thickness of 4 to 8 mm and they fuse, in the meantime the trapezoidal sheet has shown a better performance. As the sheets thickness increases from 8 upwards, the energy dissipation in the vertical sheets reduces, which is not suitable for the defined beam and column elements. Therefore, designing the length and thickness of the vertical link sheet to the beam properties is of great importance.

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