Simplified nonlinear progressive collapse analysis of steel moment frames considering floor slab effects

†S. Kim* and S. Lee

[1]Department of Architecture and Plant Engineering, Youngsan University, Republic of Korea.

*Presenting author: swkim@ysu.ac.kr
†Corresponding author: swkim@ysu.ac.kr

Abstract

An energy-based simplified nonlinear static progressive collapse analysis method of steel moment frames considering the contribution of the composite floor slab is proposed in this study. To this end, the behavior of the double-span composite floor slab is first investigated through the material and geometric nonlinear finite element analysis. The polynomial for calculating the contribution of the double-span composite floor slab is derived from the deformed shape of the double-span composite floor slab obtained from the numerical results. The application of the proposed simplified model can be utilized in conducting more precise energy-based progressive collapse analysis of steel moment frames.

Keywords: Progressive Collapse, Steel Moment Frames, Composite Floor Slab, Finite Element Analysis, Strain Energy, Simplified Analysis Method.