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Numerical Studies on Planning and Analyzing Blast Demolition Behaviors of Buildings

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In this paper, we describe a blast demolition planning tool using key element index in which the contribution of a structural column to the vertical capacity of the structure can be investigated numerically. We investigated the tendencies of the demolition modes of simple framed steel structures and obtained the relationship between floor height - span ratio of buildings and efficiency of blast demolition. It is confirmed that the efficient way to demolish the whole structure varies with the ratio values. A blast demolition analysis code for framed structures is also developed using the ASI (Adaptively Shifted Integration) -Gauss technique, and is applied to confirm the demolition plans of buildings obtained by the blast demolition planning tool. We also applied the analysis code to investigate the demolition behaviors of a large-scale steel frame.

Keywords: Blast demolition plan, Blast demolition analysis, Key element index, ASI-Gauss technique