

Investigation of Building Pounding during Earthquake and Calculation of Impact Force between Two Adjacent Structures

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Abstract : Seismic excitation is naturally caused large horizontal relative displacements, which is able to provide collisions between two adjacent buildings due to insufficient separation distance and severe damages are occurred due to impact especially in tall buildings. In this paper, an impact is numerically simulated and two needed parameters are calculated, including impact force and energy absorption. In order to calculate mentioned parameters, mathematical study needs to model an unreal link element, which is logically assumed to be spring and dashpot to determine lateral displacement and damping ratio of impact. For the determination of dynamic response of impact, a new equation of motion is theoretically suggested to evaluate impact force and energy dissipation. In order to confirm the rendered equation, a series of parametric study are performed and the accuracy of formula is confirmed.

Keywords : pounding, impact, dissipated energy, coefficient of restitution

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