Abstract

During earthquakes, pounding of adjacent buildings occurs due to their different dynamic characteristics as well as insufficient separation distance between them. Although earthquake loading is commonly considered in structural design, pounding of adjacent buildings is not usually considered and usually causes highly unexpected damages and failures. Pounding effect was numerically investigated in this study, where adjacent buildings were designed to resist lateral earthquake loads without taking into consideration the additional applied force resulting from pounding. Nonlinear dynamic analysis was carried using the Applied Element Method (AEM). Pounding of buildings of different structural systems, different gravity loading and different floor heights was investigated. Dynamic behavior in terms of additional base shear, base bending moments and pounding forces was investigated for different gap distances.
less than the safe gap distance specified by the Egyptian Code of Practice (ECP). Effect of gap distance, building's dynamic characteristics, building's height and gravity loads on additional straining actions due to impact was discussed.

References

- Kasai, K. and Maison, B. "Structural Pounding Damage, Loma Prieta Earthquake Reconnaissance Report, Chapter 6, Structural Engineers Association of California, 1991
- www.engineeringcivil.com
- www.appliedelementmethod.org
- Maekawa K, Okamura H. The deformational behavior and constitutive equation of concrete using the elasto-plastic and fracture model. J Faculty Eng Univ Tokyo (B) 1983;
- Ristic D, Yamada Y, Iemura H. Stress–strain based modeling of hysteretic structures under earthquake induced bending and varying axial loads. Research report No. 86-ST-01, School of Civil Engineering, Kyoto University, Kyoto, Japan; 1986.

Index Terms

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Keywords

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