

عنوان مقاله:

Application of Viscous Dampers in Seismic Response Control of High-rise Buildings with Core and Outrigger

محل انتشار:

اولین کنفرانس سالانه بین المللی عمران، معماری و شهرسازی (سال: 1394)

تعداد صفحات اصل مقاله: 6

نویسندگان:

S.M.T Hassani - *Ph.D. Student, Structural Department, Islamic Azad University of Arak*

S.M Zahrai - *Professor, School of Civil Engineering College of Engineering, University of Tehran*

خلاصه مقاله:

One of the most serious concerns as direct side effects of transforming cities toward megacities with exploding population is providing proper living place for inhabitants. In this regard, high-rise buildings received considerable attention due to significant rentable space to occupying lot ratio. On the other side, flexibility and slenderness of them opens a mostly different design considerations which encouraged researchers to seek modern innovative technologies. Among all, severe influences of lateral load i.e. earthquake excitations and wind gusts caused to be gained more attention. Current article is about to investigate efficiency of applying viscous dampers to outrigger truss-belt system with core wall under seismic loads. The study is comprised of comparing bare dual special moment-resisting and core wall system with the one which outrigger truss-belts are added. Locations of outriggers are obtained by performing Genetic Algorithm (GA) optimization and considering trapezoidal lateral load pattern. It seems for it to be more compatible with lateral load distribution of high-rise buildings which higher modes have significant influence on dynamic responses. Final goal is achieved by conducting time-history analyses on case study model which viscous dampers are installed at intersection of outriggers with perimeter columns. Varying damper parameters has illustrated necessity of choosing suitable ones with specific conditions of the ongoing project. It is showed that employing dampers with parameters out of optimum range will have negative influences on dynamic responses e.g. overturning moment of core walls. It is concluded that induced artificial damping causes building to experience much less lateral displacement in comparison of outrigger trussbelt system without dampers. In this regard, more .economical design could be announced

کلمات کلیدی:

Vibration control; Passive; Viscous dampers; High-rise buildings; Outrigger; Structural dynamics

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