

عنوان مقاله:

Design of Optimal Passive Energy Dissipation Systems Using Active Control Theory

محل انتشار:

ششمین کنفرانس بین المللی زلزله شناسی و مهندسی زلزله (سال: 1390)

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خلاصه مقاله:

In this paper, a methodology has been proposed for design of passive energy dissipation systems through active control theory. The passive control system is designed to achieve a structural response as close to that of active control system. It may be needed to reduce the stiffness of the original structure at some locations to reduce the acceleration response. Then, to compensate for the resulting increased interstory drifts, viscous fluid dampers are added to the structure at their optimum locations. The optimal distribution of dampers and the locations with reduced stiffness are obtained using the LQR active control algorithm. It is shown that the response of a properly-designed passively-controlled and softened structure can be comparable to that controlled with active devices. A case study of an 8-storey structure has been carried out to demonstrate the design technique and its application.

کلمات کلیدی:

Optimization, Softening, Passive control, Viscous dampers, Active control

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