

عنوان مقاله:

Seismic assessment of steel moment frame-rocking walls

محل انتشار:

دومین کنفرانس ملی پژوهش های کاربردی در مهندسی عمران (مهندسی سازه و مدیریت ساخت) (سال: 1396)

تعداد صفحات اصل مقاله: 11

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خلاصه مقاله:

Rocking system is one of the recent developments devised to improve the seismic behavior of structures. This paper introduces a special type of Rocking Wall-Moment Frame (RWMF) combination that consists of a Grade Beam Restrained Moment Frame, (GBRMF) attached to a co-planar, post tensioned (PT) pin supported Rigid Rocking Core (RRC) by means of Gap Opening link beams (GOLBs) and supplementary devices. It compares a 4-storey and an 8-storey steel moment frame with Fixed base Shear Walls (FSW) with the proposed alternative. Simulation and numerical analysis are carried out using SAP2000 software. Time history analysis of the subject systems is conducted using 7 earthquake records on soil types C defined by USGS. Seismic responses of the RWMFs are presented. The results illustrate that RWMFs can be treated as repairable structures because plastic hinges are well distributed and prevent sever damage to columns and footings. Furthermore, RWMFs prevent soft storey failure by imposing uniform drift along the height of the structure. RWMFs lend themselves well to self- alignment and post-earthquake repairs by using post tensioned cables and known supplementary devices.

کلمات کلیدی:

Rocking wall-moment frames, Reparability, Self- alignment, time history analysis

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