

عنوان مقاله:

Evaluation of stiffness and design of concrete moment frame reinforced with fiber reinforced polymer bars

محل انتشار:

کنفرانس بین المللی عمران، معماری و شهرسازی ایران معاصر (سال: 1396)

تعداد صفحات اصل مقاله: 7

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خلاصه مقاله:

In this study, four types of concrete moment frames reinforced with fiber reinforced polymer were designed according to ACI 440.1R-15 and then analyzed to evaluate flexural effective stiffness. The Models include three and five story frames with two and three bays. Each model contains glass fiber reinforced polymer (GFRP) and Carbon fiber polymer (CFRP). To design different sections a computer code was written to extract forces from SAP2000 software then longitudinal reinforced bars designed in a way that only resist tensile stresses and their strength under compression is neglected. Also, both beams and columns were confined to provide ductility to frame behavior. Furthermore, a frame reinforced with conventional steel bars is also analyzed as a reference to compare rebar percentage and stiffness of sections. Stiffness of all beams computed by XTRACT software which is based on moment curvature diagram. In conclusion, While the required cross sectional area of GFRP bars may be much higher than that of steel bars, the area of CFRP bars is reduced considerably. Also, FRP bars noticeably decrease the effective flexural stiffness of sections and the moment frame.

کلمات کلیدی:

Fiber reinforced polymer bar, Stiffness, Moment curvature diagram, Moment frame

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