

عنوان مقاله:

Seismic evaluation of RC moment frames with knee braces in the near-fault region

محل انتشار:

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خلاصه مقاله:

Reinforced concrete Moment resistant frame is one of the structural systems used to resist earthquake loads in buildings. Many existing concrete structures with this system need retrofitting to overcome deficiencies and to resist seismic loads. In the present study, the seismic behavior of rigid frames with knee-type braces was investigated and their response parameters, such as maximum strain in concrete cover, reinforcement and concrete core were evaluated and hysteretic behavior of frames were discussed. Two types of structures, including moment frames and braced frames with knee-type braces in beam to column joints were designed per the Iranian Seismic Design Code and the Iranian Concrete Structures Design Code. Also knee elements were designed per a trial and error method depending on columns maximum axial force. Dynamic analysis using 8 earthquake records for moment frames and braced frames were carried out to obtain dynamic responses and compute seismic parameters. According to the analysis results, concrete core and cover strain in beams and columns are decreased when knee braces with different cross sectional area are used. Also the maximum reinforcement strain in beams and columns sections is decreased as knee braces are utilized. As braced frames enters in plastic range with larger story shears therefore the plastic capacity of structures increases. Also in braced frames, the maximum displacements of the structure increases so the stiffness of the structure increases and the seismic behavior of moment frames is improved.

کلمات کلیدی:

concrete moment frame, knee brace, near-fault region, seismic design

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