



Displacement response analysis of base-isolated buildings subjected to near-fault ground motions with velocity pulse

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In order to study the influence of the velocity pulse to seismic displacement response of base-isolated buildings and the differences of the influence of the two types of near-fault ground motions with velocity pulse to seismic response of base-isolated buildings, the seismic responses are analyzed by three dimensional finite element models for three base-isolated buildings, 4 stories, 9 stories and 14 stories. In this study, comparative analyses were done for the seismic displacement responses of the base-isolated structures under 6 near-fault ground motion records with velocity pulse and no velocity pulse, in which, 6 artificial ground motion time histories with same elastic response spectrum as the 6 near-fault ground motion records are used as the ground motion with no velocity pulse. This study indicates that under the ground motions with velocity pulse the seismic displacement response of base-isolated buildings is significantly increased than the ground motions with no velocity pulse. To the median-low base-isolated buildings, the impact of forward directivity pulses is bigger than fling-step pulses. To the high base-isolated buildings, the impact of fling-step pulses is bigger than forward directivity pulses. The fling-step pulses lead to large displacement response in the lower stories.

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