

## ***Studying Rooftop Damper Frame in Braced Structures under near and far field Earthquake Excitations***

A. Yahyaabadi; S. M. Zahrai

### ***ABSTRACT***

Throughout the years, tuned mass dampers have been implemented effectively to reduce wind-induced vibrations and earthquake excitations in high-rise buildings. In this paper, the performance of braced frames with rooftop tuned mass damper frame is studied. For this purpose, linear and nonlinear time history dynamic analysis of six steel concentrically braced frames with 3, 5 and 15 stories subjected to near and far field earthquakes are conducted. Based on numerical results obtained in this research, applying a rooftop damper frame is more effective in reducing the seismic response of the braced frames with short periods of vibration than those with moderate and long lateral periods. It is found that rooftop tuned mass damper reduces the floor displacement of the 3-story building by as much as 18 to 66 percent under different earthquake excitations. Results also show that this type of damper frame with appropriate design can result in decreased seismic responses both under near and far field earthquake excitations.

### ***KEYWORDS***

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Rooftop tuned mass damper frame; linear dynamic analysis; nonlinear dynamic analysis; near field earthquakes; far field earthquakes

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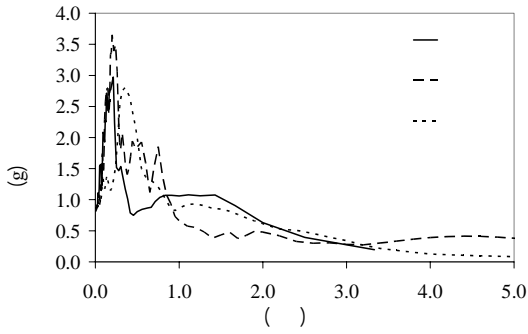
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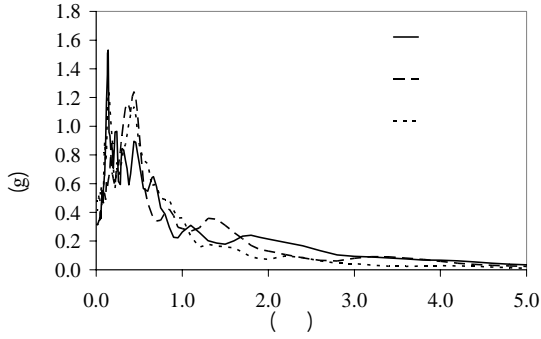
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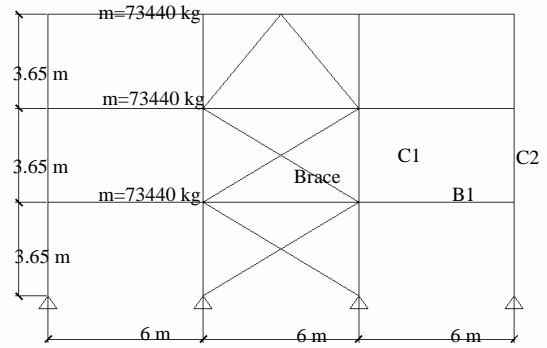
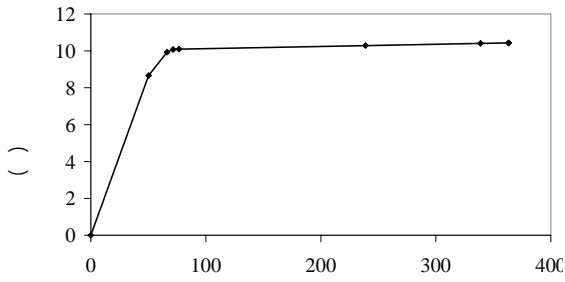
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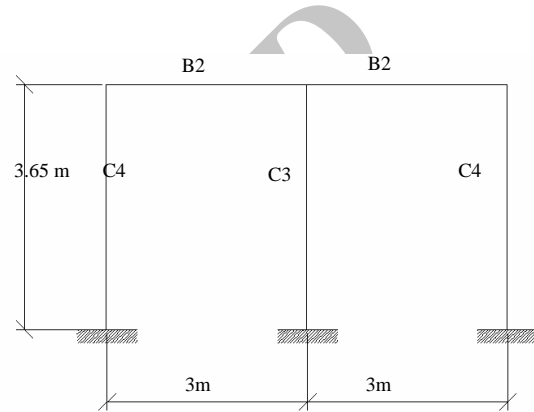
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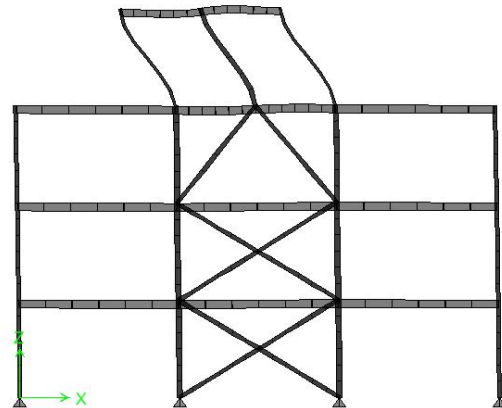
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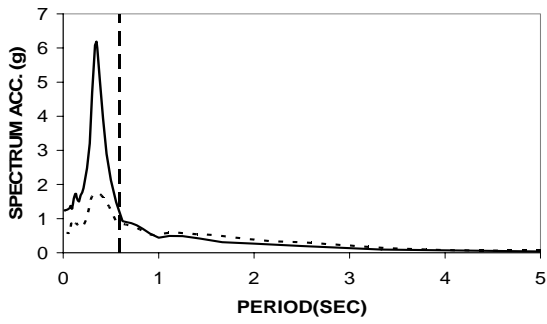
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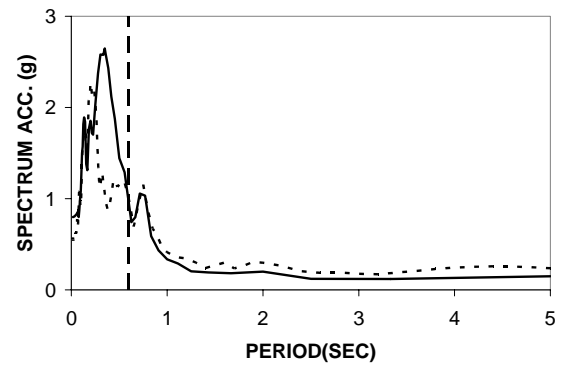
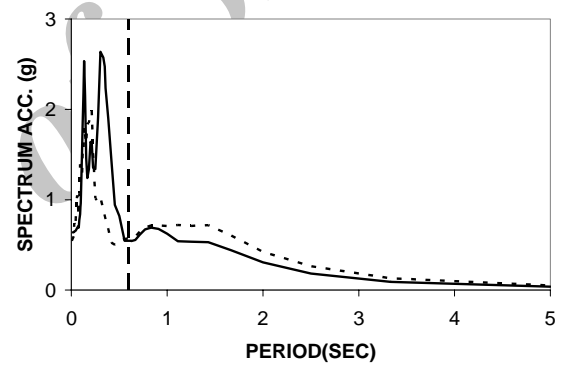
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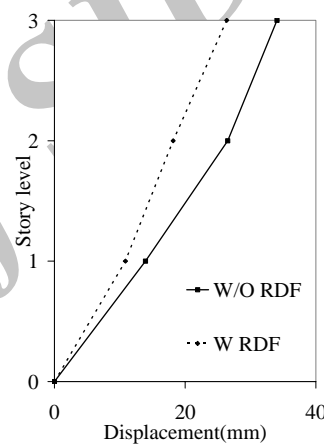
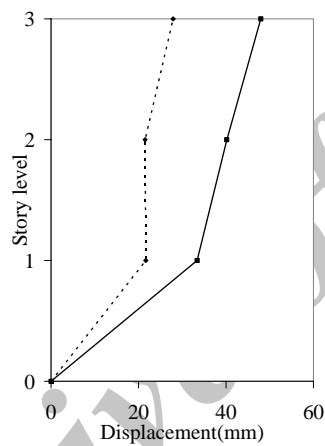
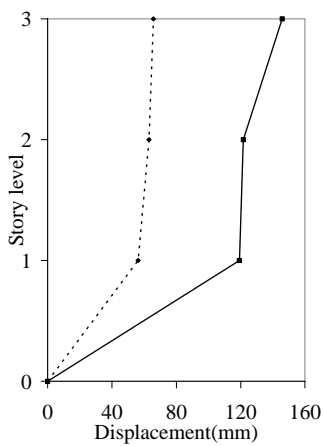
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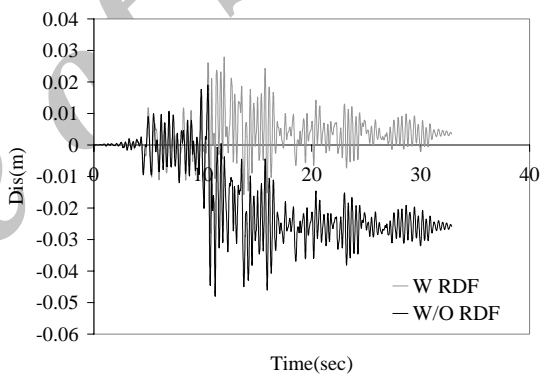
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