

Seismic Performance of a Framed Structure Retrofitted with Damped Cable Systems

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Abstract : In this work, the effectiveness of damped cable systems (DCS) on the mitigation of earthquake-induced response of a framed structure is investigated. The seismic performance of DCS is investigated using fragility analysis and life cycle cost evaluation of an existing building retrofitted with DCS, and the results are compared with those of the structure retrofitted with viscous dampers. The comparison of the analysis results reveals that, due to the self-centering capability of the DCS, residual displacement becomes nearly zero in the structure retrofitted with the DCS. According to the fragility analysis, the structure retrofitted with the DCS has smaller probability of reaching a limit states compared to the structure with viscous dampers. It is also observed that both the initial and life cycle costs of the DCS method required for the seismic retrofit is smaller than those of the structure retrofitted with viscous dampers. **Acknowledgment:** This research was supported by a grant (17CTAP-C132889-01) from Technology Advancement Research Program (TARP) funded by Ministry of Land, Infrastructure, and Transport of Korean government.

Keywords : damped cable system, seismic retrofit, self centering, fragility analysis

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