

Seismic Performance of a RC Residential Building Retrofitted by Alternative Dissipative Strategies

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Abstract

In the last two decades, increasing attention has been paid to the development and application of supplemental damping strategies, and particularly of dissipative bracing (DB) systems, in the seismic retrofit of buildings with reinforced concrete (RC) frame structure. However, the considerable number of research and design studies offered in the literature usually focus on single systems incorporating a specific type of damper, and very little space is dedicated to comparative performance analyses of different DB systems for the same retrofit problems. In this paper, a comparative study is originally presented on two different DB systems designed for a common problem, in one case equipped with Added Damping and Stiffness (ADAS) steel dissipators and in the other with Pressurized Fluid Viscous (PFV) spring-dampers. A representative case study building is examined to this aim, i.e. a 6-storey residential block with RC structure and masonry infills located in a medium-high seismicity zone in Italy, designed according to the 1986 edition of the National Seismic Standards. The article reports: the characteristics of the examined building; the results of the seismic assessment analysis in its current conditions; evaluations and comparisons of the performance improvement of the RC members and the masonry infills attained by the two retrofit solutions; and notes on relevant costs and architectural impact.

Keywords

Sustainable retrofit, Dissipative braces, ADAS dampers, PFV dampers.

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