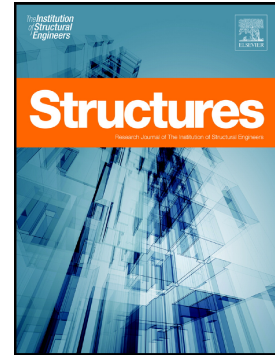


Accepted Manuscript

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PII: S2352-0124(18)30023-7
DOI: doi:[10.1016/j.istruc.2018.02.005](https://doi.org/10.1016/j.istruc.2018.02.005)
Reference: ISTRUC 254
To appear in: *Structures*
Received date: 25 August 2017
Revised date: 28 January 2018
Accepted date: 19 February 2018

Please cite this article as: M. TahamouliRoudsari, M.B. Eslamimanesh, A.R. Entezari, O. Noori, M. Torkaman , Experimental Assessment of Retrofitting RC Moment Resisting Frames with ADAS and TADAS Yielding Dampers. The address for the corresponding author was captured as affiliation for all authors. Please check if appropriate. Istruc(2017), doi:[10.1016/j.istruc.2018.02.005](https://doi.org/10.1016/j.istruc.2018.02.005)

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Experimental Assessment of Retrofitting RC Moment Resisting Frames with ADAS and TADAS Yielding Dampers

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Abstract: Due to the lack of sufficient concrete strength or change in design codes, some RC structures are in need of retrofitting. Retrofitting and reevaluating a building is only possible if the seismic characteristics of the new hybrid seismic system are specified. This study attempts to experimentally investigate the effect of using the Chevron brace with ADAS and TADAS yielding dampers in retrofitting RC moment resisting frames. Seven RC moment resisting frames were constructed and six of which were retrofitted with Chevron braces and a different number of ADAS or TADAS yielding dampers. The frames were subjected to cyclic loading and strength, crack expansion, stiffness, ductility, energy dissipation, and strength reduction factor of all the frames were evaluated. The results show that the yielding dampers not only increase the strength of the RC frame, they also elevate its strength reduction factor and ductility. The effect of the ADAS damper is better than the TADAS damper and in both cases, pinching in the hysteresis diagram has considerably decreased.

Keywords: RC moment resisting frame, retrofitting, ADAS, TADAS, seismic properties.

1. Introduction

In some RC buildings, primarily due to reasons such as changes in design codes, change in the type of the building's occupancy, increasing the number of the stories of the building, poor quality of the concrete, and lack of sufficient strength and stiffness of the structure, retrofitting is inevitable. The retrofitting procedure in these types of buildings has to be such that the structure, in addition to being compatible with the new architectural condition, satisfies design code requirements. Adding new seismic resisting elements to the building increases its strength and stiffness. It has to be noted that to assess the retrofitted structure, various seismic parameters such as the strength reduction factor, the over-strength factor, ductility, period and etc. have to be known. To calculate these parameters for standard seismic resisting systems such as RC or steel

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