

Comparative study on seismic behaviour of multi-storied buildings using viscous damper and visco-elastic damper

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ABSTRACT:

The viscous fluid dampers (VFD) and viscous dampers are the more applied instruments for controlling reactions of the structures. These apparatuses are applied dependent on various development advancements so as to diminish the basic reactions to the seismic excitation. In spite of the fact that over the ongoing years substantial expenses have been paid for exact acknowledgment of power of a seismic tremor in the examination foundations of the world to diminish its harm, the expanding requirement for more exploration concentrates on the impacts came about because of the quake is felt in the hypothetical and laboratorial scales. In the course of the most recent fifty years, the seismic tremors are arranged into two gatherings of close field quakes and far-field tremors dependent on the separation of the spot of recording the quake from the issue. Afterward, this definition was altered and different factors likewise impacted this order.

1) INTRODUCTION

In most recent couple of years, numerous fundamental improvements in seismic codes are turned up. Most extreme of the alteration in the seismic plan territory get from more noteworthy consciousness of real helpless structures exhibitions in contemporary tremors. Because of the restored information on the current structures conduct, retrofit of structures is a central undertaking in decreasing seismic hazard. New methods for securing structures against seismic tremor have been created with the point of improving their ability. Seismic separation and vitality scattering are generally perceived as powerful security strategies for arriving at the presentation destinations of current codes. Notwithstanding, numerous codes incorporate plan particulars for seismically confined structures, while there is still need of improved guidelines for vitality scattering defensive frameworks. Afterward, this definition was altered and different factors likewise impacted this order. Over the ongoing years, the examination considers focused on the investigation of effects of ground movement in the close field seismic tremor on the auxiliary execution. The devastative impacts of the ongoing tremors, for example, Northridge quake (1994), Kobe seismic tremor (1995), and Taiwan tremor (1999) on the structures of the urban areas nearby deficiency, and with respect to the nearby area of a large number of the urban areas of India to the dynamic flaws demonstrate the centrality of the exploration.

2) LITERATURE SURVEY

Ganesh P Gadakh¹, Rajashekhar S. Talikoti²

In the paper vitality dissemination gadgets for dispersing tremor vitality should be concentrated inside and out from see purpose of their effectiveness in opposing seismic tremor powers. In this paper the exhibition of thick and viscoelastic dampers are concentrated in detail. The seismic exhibitions of these dampers are contrasted and typical exposed casing building. Nonlinear modular time history examination utilizing Elcentro time history information was performed and boundaries, for example, base shear, relocation time history at rooftop level, modular timespan and greatest powers in external and internal section are looked at and introduced.

Lavanya K R¹, Dr. K. Manjunatha²

This exposition work is worried about the similar examination on impacts of Fluid viscous and Viscoelastic dampers in RC building. As indicated by IS 1893 (section 1): 2002, codal arrangements the structures are examined by Equivalent static investigation and Response range strategy. The displaying and investigation is finished with SAP 2000 programming and the outcomes that is, seismic boundaries, for example, Time period, Base shear, Lateral removal and Inter storey float are organized and afterward near investigation of structures with and without dampers has done.

Benita Merlin Isabella. K*, Dr. Hemalatha. G+

This paper presents an exhibition examination of different latent dampers, evaluating viability of 6 storey RCC Benchmark structure under controlled and uncontrolled condition. Frameworks of basic control considered are Visco-flexible Damper, Metallic Friction Damper and Viscous Fluid Damper. A multi-storey Benchmark working with 6 stories have been displayed utilizing FEMM Software bundle SAP2000, Nonlinear Time History Analysis was done for three seismic tremor ground movement information to be specific Elcentro 1940, Imperial Valley and Northridge.

3) METHODS OF ANALYSIS

TIME HISTORY ANALYSIS:

ETABS Software handles the underlying states of a period work diversely for direct and nonlinear time-history load cases.

A depiction is as per the following:

1. Linear cases consistently start from zero, thusly the relating time work should likewise begin from zero.
2. Nonlinear cases may either begin from zero or may proceed from a past case. When beginning from zero, the time work is just characterized to begin with a zero worth. At the point when investigation proceeds from a past case, it is accepted that the time work additionally proceeds with comparative with its beginning worth. A long record might be broken into numerous successive investigations which utilize a solitary capacity with appearance times. This forestalls the need to make different altered capacities.

Time-history traces

Time-history follows might be shown for a chose joint through Display > Show Plot Functions. Select the joint from List of Functions, select Define Plot Functions, select the joint once more, and afterward select Modify/Show Plot Function. Select the reaction boundary from Vector Type, and the DOF from Component. Select OK > OK to leave these structures. Select the joint once more, and afterward select Add. Since the Vertical Function is indicated, select the Horizontal Plot Function, at that point spare the Named Set whenever wanted. Select Display to introduce the plot.

4) PROBLEM DEFINITION

1. Building which is G+8 is selected and designed first without dampers.
2. The modeling of building is done using finite element based software E-TAB.
3. Realistic building is selected so that effectiveness of dampers can be studied.
4. Same building is then designed for viscous and visco elastic dampers.

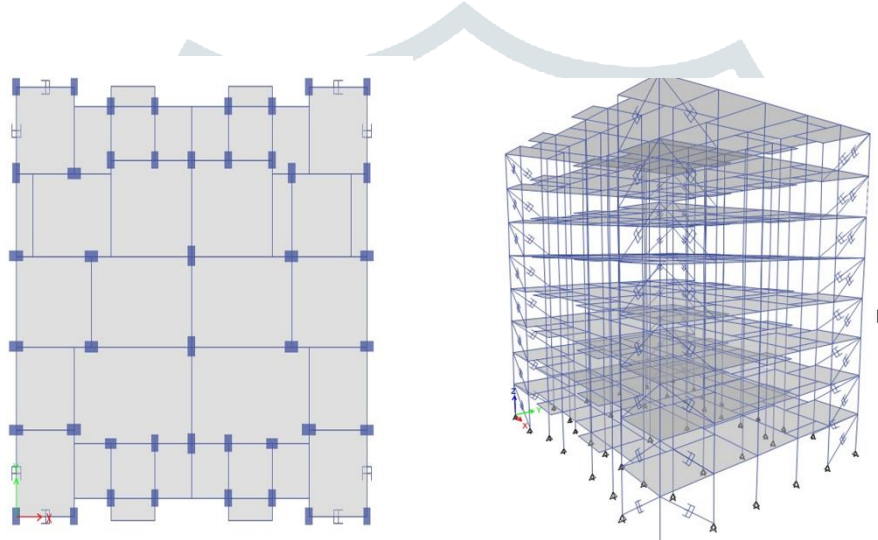


Figure 1: G+8 building Plan and Elevation

5) DAMPERS PROPERTIES

Viscous Damper Properties:

Mass - 1850 kg
Weight - 0.18 KN

Visco-elastic Damper Properties:

Mass - 2050 kg
Weight - 0.22 KN

6) RESULT

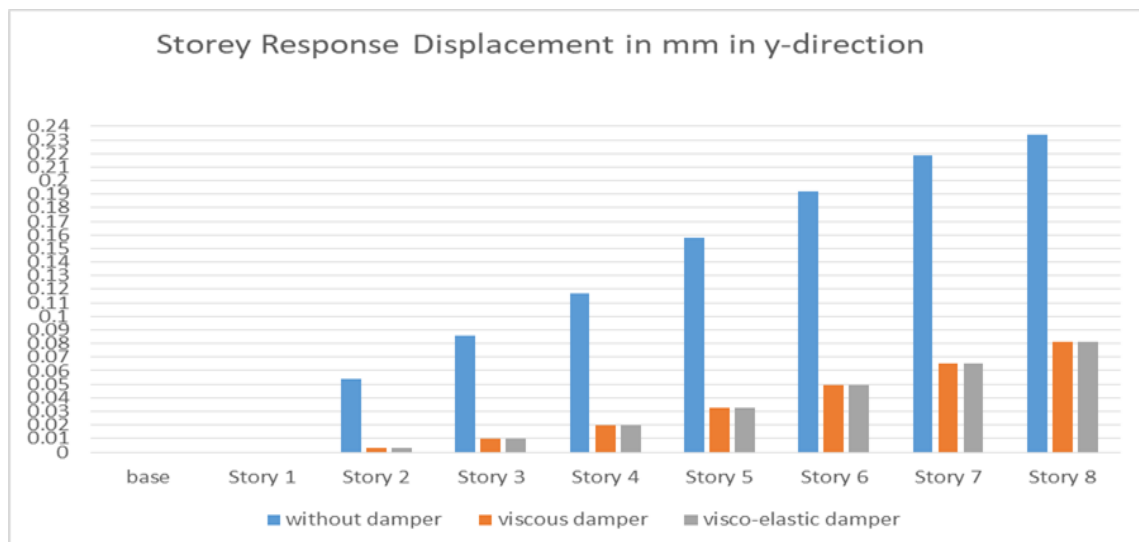


figure 2: storey displacement in y direction

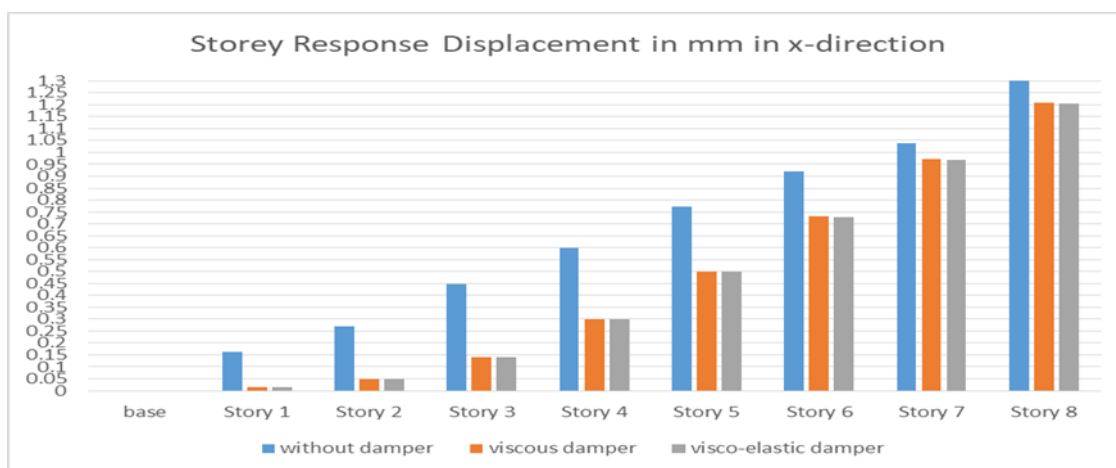


figure 3: storey displacement in x direction

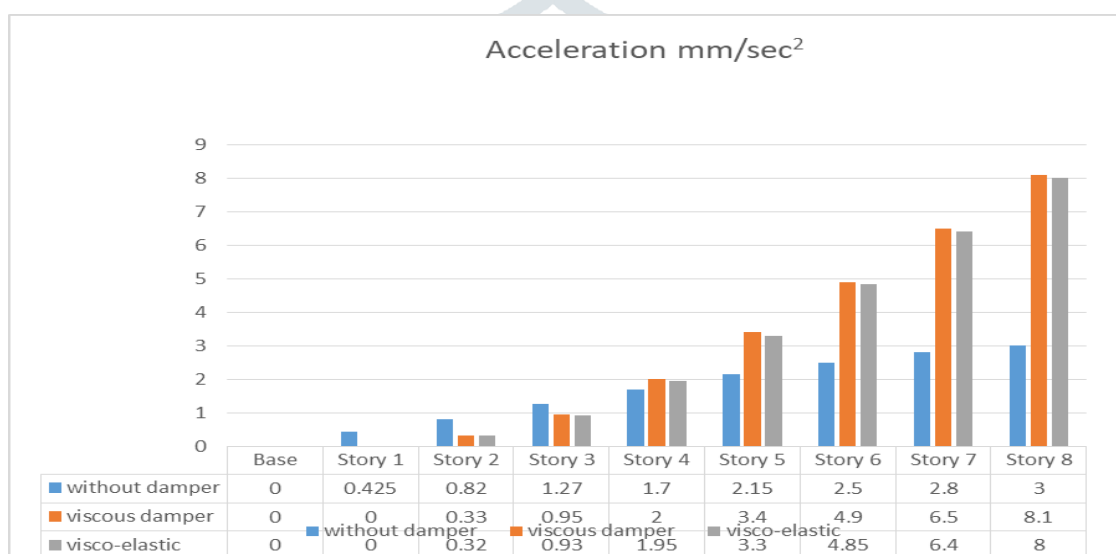


figure 4: acceleration in mm/sec²

7) CONCLUSION

Based on the results the following conclusions are drawn.

- It is observed that acceleration is comparatively increased in viscous damper and visco elastic damper.so, when earthquake occurs it provides more stability to the building.
- Viscous damper is more effective then visco elastic damper as acceleration is more as compared to visco elastic damper.
- From the storey response we also concluded displacement of without damper is more as compared to vicous and visco elastic damper.
- Viscous damper has less displacement as compare to visco elastic damper.

8) REFERENCES

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