Experiences on the Use of Supplementary Energy Dissipators on Building Structures

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ABSTRACT

Ductility, or deformation energy, is by far the largest source of energy dissipation of structures, since normal levels of internal damping represent only a small portion of energy dissipation. However, large material deformations such as those required in building components to perform in a ductile manner, are often associated with cracking and degradation of its strength, particularly in concrete structures. The installation of some manufactured devices to critical regions of structural systems, specifically engineered to concentrate on them the largest part of the dissipated energy during an earthquake, increases the structure's overall thoroughness and improves its performance and reliability during major seismic events.

This paper describes the retrofit of three buildings in Mexico City using damping devices. The size and number of these added elements are a function of the dynamic characteristics of the specific structure, the amount of previous damage, the anticipated earthquake motion imposed to the structure and the design performance level intended.

INTRODUCTION

Retrofitting earthquake damaged buildings or upgrading existing buildings to meet higher code demands is a task difficult to accomplish and of high professional risk.. On one side, the engineer who takes on either job automatically assumes the full responsibility of the structural integrity of a building designed by others, and meeting older and less stringent codes (as compared to the ones currently in use), but hopefully built according to good standard practices and with quality materials. On the other side, the analytical methods and tools used in the study of the problem have to take into consideration certain characteristics of the structure and its materials that are difficult to evaluate and ascertain, such as the amount of

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