

Thesis Title: COMPARATIVE STUDY OF BASE ISOLATED SYSTEMS

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Abstract:

This thesis is mainly concerned with providing brief knowledge about the effects of earthquakes on buildings and their response to earthquake forces. Principles of advanced passive earthquake resistant design techniques are also presented. Next, the use of the most common passive earthquake resistant design technique; i.e., base isolation is described, with its historical background, main principles and usage in the world. In order to evaluate the effectiveness of base isolation, and the performance of base isolated buildings, three story three frames are modeled with SAP 2000. Bare, Damped and Isolated respectively are compared. For the sake of comparability of the results, the input data for the three frames are kept the same and the output values such as deformation, periods of the buildings, force values are compared. After this stage, a three story structure from an experimental study is modeled in order to find the typical usage of an isolator. After obtaining this specific type of isolator, it is placed in a 6-story structure for the aim of investigating the main benefits of isolators. The structure is modeled in two cases; with and without shearwalls for the aim of evaluating the effect of shearwalls on to the behavior of the fixed and isolated structure.