

Study of the Influence of Eccentricity Due to Configuration and Materials on Seismic Response of a Typical Building

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Abstract : Seismic design is a critical stage in the process of design and construction of a building. It includes strategies for designing earthquake-resistant buildings to ensure health, safety, and security of the building occupants and assets. Hence, it becomes very important to understand the behavior of structural members precisely, for construction of buildings that can yield a better response to seismic forces. This paper investigates the behavior of a typical structure when subjected to ground motion. The corresponding mode shapes and modal frequencies are studied to interpret the response of an actual structure using different fabricated models and 3D visual models. In this study, three different structural configurations are subjected to horizontal ground motion, and the effect of "stiffness eccentricity" and placement of infill walls are checked to determine how each parameter contributes in a building's response to dynamic forces. The deformation data from lab experiments and the analysis on SAP2000 software are reviewed to obtain the results. This study revealed that seismic response in a building can be improved by introducing higher deformation capacity in the building. Also, proper design of infill walls and maintaining a symmetrical configuration in a building are the key factors in building stability during the earthquake.

Keywords : eccentricity, seismic response, mode shape, building configuration, building dynamics

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