Effect of Plan and Vertical Irregularities of Framed Structures in Earthquake Performance: A Case Study

Sridhar M[1, a)], Yamini V[2, b)], Vinod Kumar M [3, c)] Nivedha D G S[4, d)]

[1]Research Scholar, [2,4]Assistant Professor, [3]Associate Professor Department of Civil Engineering
Vel Tech Rangarajan Dr.Sagunthala R & D Institute of Science and Technology, Chennai, India.
msridhar@veltech.edu.in

ABSTRACT

Earthquake is one of the major disasters which always being a threat for the building structures. As per the IS 1893(Part-I):2016 stipulations, out of the four main desirable attributes of an earthquake resistant building, the robust structural configuration is a most simple yet effective and important attribute. Unlike the other attributes, for structural configuration no additional cost may be required at all the cases. The performance of a building affected by the earthquake ground motion primarily depends on its configuration. One of the influential reasons for the building's collapse recognized from the precedent earthquakes is the irregular configuration of building. In this way, the analysis and design of a building with irregular configuration particularly, when it is located in a severe seismic zone, turn into a matter of concern. While designing an irregular building, it is essential to select an appropriate type, degree and location of irregularity. The current study deals with the seismic response of RC structures having various individual and combined complicated geometric irregularities. A regular building frame is customized by integrating various geometric irregularities in its horizontal and/or vertical planes. With the aim of gauging the significance of the regularity, a regular configured building along with three number of irregular configurations are analyzed and compared using the ETABS software as per IS 1893(Part-I):2016. The performance of all the models is made based on the Base shear, Fundamental period, Story Stiffness, Lateral-displacement and Story Drift.

Keywords: *Earthquake, Irregularities, Configuration, Geometry.*