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"STUDY ON THE INFLUENCE OF VERTICAL GEOMETRICAL IRREGULARITIES ON THE TIME PERIOD OF RC BUILDINGS"

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ABSTRACT

KEYWORDS: Vertical geometric irregularity; Fundamental time period; ETABS; Setback building; Eigenvalue analysis.

Design and build of earthquake resistant building or a structure requires us to understand the building's response to an earthquake by performing either static or dynamic analysis. Static analysis is preferred for a regular building with more or less equal distribution of mass and stiffness among different floors of a building. The Indian standard code discourages the construction of irregular buildings but when unavoidable the code suggests to use dynamic analysis to understand the seismic response of the building. The construction of buildings with irregularity have become common and inevitable in the present urban scenario owing to space constraints and greater population.

The response spectrum analysis is one of the methods of dynamic analysis and the base shear value calculated using this method is indirectly dependent on the time period of a building. Many of the international codes and the Indian standard code mandates the designers to scale up the base shear values obtained from dynamic analysis when the it is less compared to the one obtained through the conventional approach. In the recent revision of IS 1893 (Part 1): 2016 an attempt is made to calculate the time period of an irregular building on the basis of the average height.

In this study 198 models of various types of vertical geometrical irregularities is considered along with the other parameters like bay width, building height and the stiffness of a non-structural wall is also considered by modelling it as a single equivalent diagonal strut.