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A Study on the Behavior of Symmetrical, L-Shape and T-Shape RC Building during Earthquake

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Abstract: *The occurrence of irregularities in mass, stiffness, strength or geometry along the elevation of the building is classified as vertical irregularity. Torsional irregularity or in-plan irregularity can be regarded to exist if the building possesses non-concurrency in the lines of action of centers of mass and stiffness on a common vertical axis at each floor level. Throughout earthquakes or any other lateral loads, the inertia force acts through the center of mass and resistive force through the center of stiffness or resistance. Irregularities in mass and stiffness along the height of the buildings in combination with torsional irregularities along the plan of the buildings are evaluated. Transient analysis is implemented to analyse the seismic response of the shear wall buildings, mass irregular buildings and stiffness irregular buildings with in-plan eccentricity using Etabs software. The responses of the irregular buildings and the outcome of in-plan eccentricity in terms of variation in natural period, base shear storey drifts, roof deflection, torsional resultant and roof rotations obtained from the analysis due to asymmetry have been calculated in detail. As concerns the seismic responses of the irregular buildings, equations and irregularity coefficients are planned to quantify and compare buildings with of vertical and torsional irregularity in combination. It is also attempted to suggest modification for the approximate natural period expression given in the IS 1893:4016 and ASCE 7-16 to incorporate the in-plan eccentricity and evaluate the natural period of irregular buildings. It is observed that the existence of in-plan eccentricity if present singly or in combination with any other irregularities, determines the overall seismic behavior of a building and tends to modify its response.*

Keywords: RC Building

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