

Effect of Irregularities on Seismic Performance of Building

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Abstract : In multi-storeyed framed buildings, damage occurring from earthquake ground motion generally initiates at locations of structural weaknesses present in the lateral load-resisting frame. In some cases, these weaknesses may be created by discontinuities in stiffness, mass, plan, and torsion. Such discontinuity between storeys is often associated with sudden variations in the vertical geometric irregularities and plan irregularities. Vertical irregularities are structures with a soft storey that can further be broken down into the different types of irregularities as well as their severity for a more refined assessment tool pushover analysis which is one of the methods available for evaluating building against earthquake loads. So, it is very necessary to analyse and understand the seismic performance of the irregular structure in order to reduce the damage which occurs during an earthquake. In this project, a multi-storey (G+4) RCC building with four irregularities (stiffness, mass, plan, torsion) is studied for earthquake loads using the response spectrum method (dynamic analysis) and STADD PRO. All analyses have been done for seismic zone IV and for Medium Soil. In this study effects of different irregularities are analysed based on storey displacement, storey drift, and storey shear.

Keywords : comparison of regular and irregular structure, dynamic analysis, mass irregularity, plan irregularity, response spectrum method, stiffness irregularity, seismic performance, torsional irregularity, STAAD PRO

Conference Title : ICSIBE 2022 : International Conference on Sustainable Infrastructure and Built Environment

Conference Location : New York, United States

Conference Dates : October 06-07, 2022