World Academy of Science, Engineering and Technology
International Journal of Civil and Architectural Engineering
Vol:11, No:02, 2017

# Effects of Variation of Centers in the Torsional Analysis of Asymmetrical Buildings by Performing Non Linear Static Analysis

**Authors :** Md Masihuddin Siddiqui, Abdul Haakim Mohammed

**Abstract :** Earthquakes are the most unpredictable and devastating of all natural disasters. The behaviour of a building during an earthquake depends on several factors such as stiffness, adequate lateral strength, ductility, and configurations. The experience from the performance of buildings during past earthquakes has shown that the buildings with regular geometry, uniformly distributed mass and stiffness in plan as well as in elevation suffer much less damage compared to irregular configurations. The three centers namely- centre of mass, centre of strength, centre of stiffness are the torsional parameters which contribute to the strength of the building in case of an earthquake. Inertial forces and resistive forces in a structural system act through the center of mass and center of rigidity respectively which together oppose the forces that are produced during seismic excitation. So these centers of a structural system should be positioned where the structural system is the strongest so that the effects produced due to the earthquake may have a minimal effect on the structure. In this paper, the effects of variation of strength eccentricity and stiffness eccentricity in reducing the torsional responses of the asymmetrical buildings by using pushover analysis are studied. The maximum reduction of base torsion was observed in the case of minimum strength eccentricity, and the least reduction was observed in the case of minimum stiffness eccentricity.

**Keywords :** strength eccentricity, stiffness eccentricity, asymmetric structure, base torsion, push over analysis
**Conference Title :** ICCSE 2017 : International Conference on Civil and Structural Engineering
**Conference Location :** Mumbai, India
**Conference Dates :** February 07-08, 2017