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Assessment of Seismic Behavior of Flat Slabs in G+20 Building Structure

Anuj Raghunath Dalvi
Department of Civil Engineering, G H Raisoni College of Engineering and Management, Pune
Girish V Joshi
Assistant Professor, G H Raisoni College of Engineering and Management, Pune

Abstract:

Flat-slab building structures possesses major advantages over traditional slab-beam-column structures because of the free design of space, shorter construction time, architectural –functional and economical aspects. Flat-slab structural system is significantly more flexible for lateral loads then traditional RC frame system due to absence of deep beams and that makes the system more vulnerable under seismic events

With few modifications by addition of beams and RC walls, flat slab system can be considered with acceptable seismic risk. Perimeter beams and RC walls improve strength and stiffness, improving seismic behaviour of flat slab construction system. Flat slab building structures are significantly more flexible than traditional concrete frame/wall or frame structures, thus becoming more vulnerable to second order P-Δ effects under seismic excitations. The characteristics of the seismic behaviour of flat slab buildings suggest that additional measures for guiding the conception and design of these structures in seismic regions are needed, as for instance the possible combination with other seismic resistant structural systems.

This paper aims to evaluate the Seismic behaviour of flat slab buildings in comparison to conventional reinforced concrete beam slab system used in combination with columns and shear walls, using ETABS analysis and design software. The study focuses on analysing and comparing key parameters such as displacement, inter-storey drift, base shear and modal mass participation by application of both wind and seismic loadings for the dynamic analysis.