Review Paper on Behavior of Flat Slab Under Dynamic Loading

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Abstract

Structures with a large degree of indeterminacy is more to one with less indeterminacy, if yielding takes place in any one of them and members are monolithically connected to each other, then a redistribution of forces takes place. So it is necessary to study analysis of seismic behavior of building. Flat slab building structures are significantly flexible than traditional concrete wall structures or frame structures (beam-column-slab), thus becoming more vulnerable to seismic loading condition. Therefore, the characteristics of the seismic behavior of flat slab buildings suggest that guiding the concept and design of these structures in seismic regions are needed. Flat-slab have high degree of structural efficiency, therefore it is most widely used systems in reinforced concrete construction. It uses simple formwork arrangement and reinforcing arrangement, and requires the least story height. Five different models (conventional slab, flat slab, flat slab with drops, flat slab with column head and flat slab with column head & drop) are used in linear static analysis and Response spectrum method, analyzed in ETABS.

Keywords: Flat Slab, Response Spectrum Method, Seismic Load, Drop

I. INTRODUCTION

Flat slab is a reinforced concrete slab supported directly by concrete columns without using beams.

RCC flat slabs are one of the most popular systems used in various types of buildings, car parks and many other structures. These structures represent elegant and easy to construct floor system. As flat slab building structures are significantly more flexible than traditional concrete structures, thus becoming more vulnerable to seismic loading. Therefore, the characteristics of the seismic behavior of flat slab buildings suggest that additional measures for guiding the conception and design of these structures in seismic regions are needed. They favored by both architects and clients because of their aesthetic appeal and economic advantage.

II. LITERATURE REVIEW

Sanjay P N,” Behavior of flat slab RCC structure under earthquake loading.” This paper studies the comparison of the behavior of multi-story buildings having flat slabs with drops and without drops. Performance can be of these 2 types of buildings under seismic loading. For this types the zones are considered as 2, 3, 4 and types of soil are type1 and type2 condition as per IS code provision. Present work provides more information about parameters like story shear, base shear, storey drift and maximum bending moment at column for this author takes 6 stories having 77mx55m dimension using ETABS for ESA and RSA.
Kalyan Chowdary,” Comparative study of seismic performance of high rise 30 story building with beam slab, flat slab and alternate flat beam slab systems in zone 5.” In this paper there is performance of conventional RC frame structure, flat slab and alternate flat slab beam slab building models with 30 stories with different loading condition were studied.

R. P. Apostolska,” Seismic performance of flat slab building structural systems.” Paper shows that flat slab with certain modification (design of beam in the perimeter of the building and/or RC wall) can achieve some factor of behavior considering EC8 and can be consider as a system with acceptable seismic risk. For this evaluate the seismic and resistance of flat slab building, residential building in skopje with B+GF+4+A have been carried out.

K. S. Sable,” Comparative study of seismic behavior of multistory flat slab and conventional reinforced concrete framed structures.” Analysis of seismic behavior of building for different heights has seen and what changes are going to carried out if height of traditional and flat slab changes. Traditional RCC structure and flat slab for different heights are modeled and then analyzed for the different combination of static loading. Comparison is made in staad pro software.

Abhishek Lakshman Dhangar,” A comparative study of flat slab structure and conventional structure.” By knowledge we know that flat slab is preferred as a floor system because of its architectural appearance, flexibility of flat slab RC structure, easy to construct and economic structure. However seismic vulnerability of flat slab is evitable fact. This system responds more to earthquake loading in comparison to conventional structure. But by what amount and whether it is within acceptable limits and if not what measures can we take to reduce the seismic response of flat slab structure. So aims to study seismic response of flat slab structure with different heights as well as variation in plan

Sumit Pahwa,” Comparative study of flat slab with old traditional two way slab.” In this paper the objective is to compare behavior of flat slab with old traditional two way slab. The parameter studies are maximum lateral displacement, storey drift and axial forces generated in columns. Shear wall is considered and having plan 16mx24m for two way slab and 15x25m for flat slab, and analyzing in staad pro software. For this zones are 3, 4, with varying height 21m, 27m, 33m, 39m.

III. CONCLUSION

From above review lots of research has been done on dynamic analysis of flat slab building so I would like to compare analysis between five models conventional slab, flat slab, flat slab with drop, flat slab with column head and combination of drop and column head in ETABS.

Some conclusions are seen in review papers related to my analysis and they are
- Enhance resistance to punching failure at the junction of concrete slab & column by providing drop with head.
- Drop with head & Flat slab head is very good combination to reduce the moment with less thickness of slab. In earthquake zone we shall provide only flat slab drop with head & ductile detailing for all structure.

REFERENCES