REVIEW ON FLAT SLAB

Rohit Mule[1], Adarsh meshram[2], Akshay Gharde[3], Prof.Payal Dugane[4], Mohammad Riyazuddin Siddique[5]

[1,2,3](BE Student Department of Civil Engineering, Priyadarshini JL College of Engineering, Nagpur, India)

[4](Asst.Professor Department of Civil Engineering, Priyadarshini JL College of Engineering, Nagpur, India)

[5](M.Tech(Structure) Structural Engineer & Consultant, Nagpur, India)

ABSTRACT

This paper includes the basic knowledge and information about flat slab building system.The aim of the project is to analyse the flat slab structure which is completely resting on wall.This paper mention that the structure behavior of flat slab building which is completely resting wall under static and lateral loading. The paper also gives knowledge and information about which building is more safe. It represents in comparison between flat slab building and normal conventional building. This comparison is done to identify which building is more safe from seismic condition. Flat slab building design by two methods 1] Direct design method or 2] Equivalent frame method. There view of different literature and researchers also their find outs, inputs, experiments, comparison, methods and making of models to get detailed study about flat slab system is mention in the paper. Paper represent different types of flat slab, advantages, limitation and objectives of flat slab building system.

KEYWORDS: *Seismic Condition, Direct Design Method, Equivalent Frame Method, Compression, Lateral Loading.*

l.INTRODUCTION

l.Scope and objective:

The main objective of this paper is to study and to analyse the behavior of flat slab supported on walls instead of column for particular structures. The unsafeness of flat slab resting on walls is studied under the different factors which are storey drift, lateral displacement, time period and base shear.

l.Slab:

Construction of the general conventional building normaly involves column, slab and beam, where as a concrete slab provide an economical and versatile method of supporting gravity loads. When slab is combined with other elements like beam, drop panels, column, etc then it is known as roofing system.

The slab provides entire part of the structural frame to sustain lateral load. It supported on consistent concrete beam, steel beam, walls, or directly over the column. As lab can be constructed by using any method, but it should be satisfied the important necessary conditions like equilibrium and Geo-matric compatibility condition.

lV.Flat Slab:

The Slab is directly rested on the column without beam is known as flat slab. Flat slab can be also known as beamless slab as in the frame system it could without beam. In the case of flat slabs concrete slab supporting directly by column without using a beam. Flat slab is

one of the most popular system used in various types of building like car parks and many other structures because of its several advantages. Nowadays the slab has gained popularity in the construction industries because of simple form work and ease of construction.

Flat slab system contains some disadvantages also, the main disadvantage is punching shear failure.bPunching shear is a type of failure of concrete slab(flatslab). Flat slabs are economical since they have no beams and hence can reduce the floor height by 10-15% and it is concluded that flat slab reduce floor height and give creative and gorgeous appearance. Different aspect of flat slab building has been compared to the normal conventional building to know which building is more safe from various natural problems like earthquake or different aspects of the flat slab building over normal building has been assessed for seismic safety. Flat slab is designed by 1) Direct design method, 2) Equivalent frame method.

l.METHEDOLOGY

For this IS 456-2000 permit use of any of the folowing two methods:

l.The direct design method.

l.The equivalent frame method.

The direct design method and the equivalent frame method are the approximate method. In this method, the bending moment and the shear force changes significantly. For the analysis of programme, the approach of the refined finite elements which are easy to used.

l.Direct design method:

For the analysis of flat slabs, the direct design method is very simple and approximate method. The total moment is calculated and distributed in the column strips and middle strips respectively.

lV.Equivalent frame method:

The moment distribution method is calculated by using the fixed end moment on each span, in this method. In these methods, there is a calculation of negative moments between the left and the right supports and the maximum positive moment in middle span.

V.Seismic Co-Efficient Methodology:

The calculation of elastic stiffness of a building is very easy in the first stage of the design. For earthquake resistance design the RC structure is caused by the strong ground shaking factor. The seismic coefficient method isused to calculate storey displacement storey shear, storey height or No. of storey curves.

The basic concept of the topic like, seismic elevation of building structure, spectrum analysis by referring to books, technical papers or research papers. The models are compared for shear, bending moments, mode shapes, drift, punching, etc. By using the software, the hospital building with flat slab resting on the column is analysed. Also the same column will replaced by the shear wall according to plan and also analyzing the different zones.

Vl.Punching Shear:

The depth of flat slab should be governed in punching shear. The mechanism of the flat slab required should be researched in punching shear. There inforcement of flat slab in

punching shear is increased through the introduction of EC2 as well as BS8110 which is feathery used. Punching shear failure is the main disadvantage in the flat slab system. In concrete slab punching shear is a type of failure which is mainly situated to high localized forces and it caused due to the transfer of shear forces and unbalanced moments between slabs and columns.

In flat slab, it occurs at the column support point. Because of the brutal nature of flat slab structural system, punching shear failure occurs suddenly without any warning before the colapse and these types of failure is very dangerous and creates serious problems. This is one of the major problems or drawbacks in the design of the flat slab system. Once the punching shear failure occurs the resistance of the structure is significantly reduced, which causes separation of the columns and slab and then leads to colapse at the hole structure.

l.LITERATURE REVIEW

***Sumit Pawah**:*

The main aim is to compare the behavior of flat slab with two way slab with the effect of shear walls. The study includes a maximum lateral displacement storey drift and axial forces generated in the column. For this type of situation models has been created for two way slab with shear walls and flat slab with shear walls this experiment tells us about the seismic behavior of the slab.

A.Dattatreya Kumar:

During the earthquake unbalanced movement are generated, this unbalanced movement produces significant shear stresses because of shear stresses the pinching shear failure produce in the slab column. This paper also investigates on which type of combination produces less punching shear at the slab column joint.

Fayazuddin Ahmed Syed:

The study includes analysis of Flat slab in multi-storied buildings with and without shear wall under wind load.

K. P. Jaya. S:

The paper includes explanation and investigation, which is carried made out to study the seismic behavior of flats labor flat slab uses during earthquake. The paper also includes plans of shear reinforcement in the joint core area which is an effective and important option for flat slab wall to deal with seismic risks.

P.V. Sumanth Chowdary:

We are study the solution for shear wall location and type of shear wall in seismic prone areas. The effectiveness of RCC shear wall building is studied with help of four different models. Model one is bare frame system and remaining three types are different shear wall buildings. An earthquake load is applied to 8 storey building located in different zones. The performance of building is evaluated in terms of lateral displacements of

lV.CONCLUSION

l.Advantages:

The flat slab system is a special structural form of concrete construction that possesses major advantages over the normal conventional building. Nowadays flat slab building is more convenient than a normal conventional building because, flat slab building provides advantages over conventional building in terms of architecture conformability, use of the space and easier form work under earthquake loads. Flat slab system is very simple in construction and it requires the minimum building height for a number of stories.

l.Limitations:

Punching shear failure:

In concrete slab punching shear is a type of failure which is mainly situated to high localized forces and it causes due to the transfer of shear forces and unbalances moments between slabs and columns. Because of the brittle nature of flat slab structure system, punching shear failure occurs suddenly without any warning before the colapse and these types of failure is very dangerous and creates serious problems.

Limitation of direct design method:

There must be minimum of three continuous spans in each direction. Successive span in each direction shall not differ by more than 1/3 times longer span. Column may be off set from the basic rectangular grid of the building by upto 0.1 times the span parallel to the off set.

Possible application of the paper:

The main objective of the paper is to give basic and detailed information about the flat slab system. Due to the calculation of punching shear stress, bending moment and shear forces this paper can be utilized directly in the construction of flat slab. Paper focuses and gives a detailed study of advantages, different method of designing flat slab and limitations of flat slab. Paper presents an experiment and analytical behavior of the flat slab against punching shear under different support condition. In this paper many researchers or literature gives their reviews about flat slab by conducting studies experiments and model.

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