

**TO STUDY FLAT PLATE STRUCTURAL SYSTEM AND COMPARE IT'S
BEHAVIOR WITH MOMENT RESISTING FRAME AND SHEAR WALL
SYSTEM UNDER LATERAL LOADS
(MAJOR PROJECT REPORT)**

Submitted in partial fulfillment of the requirements

For the award of the degree of

MASTER OF TECHNOLOGY

In

CIVIL ENGINEERING

(Structural Engineering)

Submitted By

**RAJAT SHUKLA
ROLL NO. 2K11/STE/27**

under the guidance of

DR. NIRENDER DEV



**DEPARTMENT OF CIVIL ENGINEERING
DELHI TECHNOLOGICAL UNIVERSITY
SHAHBAD DAULATPUR, BAWANA ROAD
DELHI-110042 INDIA
MAY 2014**



CANDIDATE'S DECLARATION

I do hereby certify that the work presented in this report entitled “To study flat plate structural system and compare it's behavior with moment resisting frame and shear wall system under lateral loads.” in partial fulfillment of the curriculum of sixth semester of Master of Technology in Structural Engineering, submitted in the Department of Civil Engineering, DTU is an authentic record of my own work under the supervision of Dr. Nirender Dev, Professor Department of Civil Engineering.
I have not submitted this matter for the award of any other degree or diploma.

Date : July 30,2014

(Rajat Shukla)

2K11/STE/27

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

(Dr. NIRENDER DEV)

Professor

Department of Civil Engineering,

Delhi Technological University

ACKNOWLEDGEMENT

I wish to express my sincere gratitude and indebtedness to my guide Dr. Nirender Dev. It is due to his clarity of thinking and expression, this work has some substance and makes a better reading. The innumerable discussions that I had with him, has made a deep impact on my understandings. He is always ready to welcome his students with doubts in any sphere. Without his valuable suggestions, inspiration and guidance this report could not have been possible.

I would like to thank all my friends who have in their own way helped in keeping me energized and encouraged me whenever I felt disheartened, to complete this thesis.

At last I thank god and my parents for giving me strength and courage.

*Rajat Shukla
(2K11/STE/27)*

ABSTRACT

In the present scenario, the buildings being constructed in India are increasing in Heights. The metropolitans are witnessing higher and higher towers with each coming day. Though, the average height of these new buildings may be ranging between 25-30 stories, there are a number of structures which are fairly high and need better structural understanding to give economical and safer designs.

Majority of structures in India are based on the traditional Moment resisting frame concept in which the beams and columns cater to the gravity loads as well as the lateral loads by virtue of its moment resisting capacity. But this system is not efficient for buildings with heights greater than 15 stories. Hence, a different concept of shear wall is being widely used as a suitable alternative. With shear walls lateral force resisting capacity of buildings is improved drastically. With the use of shear wall structural system together with special moment resisting frame or with ordinary moment resisting frame the height of building has increased to 30 stories.

But, in order to achieve economy, aesthetics and architectural requirements a new structural system which comprises of only slab and column mechanism is being looked upon. This structural system is called as flat plate system in which the thickness of slab remains constant and columns rest directly on the slabs without any drops or beams. This system not only has an aesthetic edge over traditional beam-column system or flat slab system, but also proves to be economical because of lower construction time and lesser storey height.

In this paper we have studied the behavior of flat plate system with increase in height. The study comprises of buildings with and without shear wall systems. The problem areas of using flat plate system have been discussed in this paper, which primarily comprise of unbalanced moment transfer of moment from column to slab, and lesser stiffness of the building as a whole to resist lateral loads.

The behavior of flat plate system has also been compared with the traditional beam column moment resisting frame system and their differences have been studied.

Analysis of Flat plate under gravity loading has also been performed in computer software and is compared with the direct design method of IS 456.

Future scope of this paper includes economical comparison of the moment resisting frame structure and flat plate structure.