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ANALYSIS AND DESIGN OF FLAT SLABS USING VARIOUS CODES

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Abstract- A story framework assumes a critical part in general cost and administration of the building. These days level chunks are utilized as a part of the greater part of the building in light of its points of interest. There are two techniques for investigation of RC level piece viz. Coordinate Design Method and Equivalent Frame Method. The goal of this paper is to show investigation and outline of RC level chunk utilizing two unique techniques and think about the predominance of the two strategies more than each other by different perspectives. Additionally Finite component investigation and Equivalent edge examination is done by utilizing programming SAFE.

Keywords- RC Flat Slab, Direct Design Method (DDM), Equivalent Frame Method (EFM), SAFE

I.INTRODUCTION

A chunk is a level two dimensional planar auxiliary component having thickness is little when contrasted with its other two measurements. It gives a working level surface or a covering cover in structures. It essentially exchanges the heap by bowing in maybe a couple bearings. Strengthened solid sections are utilized as a part of floors, rooftops and dividers of structures and as the decks of scaffolds. The floor arrangement of a structure can take many structures, for example, in situ strong section, ribbed chunk or pre-thrown units. Pieces might be upheld on solid bar, steel bars, dividers or straightforwardly finished the segments. Solid section carry on essentially as flexural individuals and the plan is like that of shafts. [1] Level plate/sections are sparing since they have no bars and consequently can decrease the floor stature by 10-15%. Thus level plate/piece development has been practically speaking in west for quite a while. However the innovation has seen substantial scale utilize just in a decade ago and is one of the quickly creating advancements in Indian building industry today. [2] Material advances in solid quality accessible for development, change in nature of development; less demanding outline and numerical methods has added to the quick development innovation in India.

II.METHODOLOGY

For this IS 456-2000 licenses utilization of any of the accompanying two techniques:

(a)The Direct Design Method

(b)The Equivalent Frame Method

Both Direct Design Method and Equivalent Frame strategies are estimated techniques so benefits of bowing minute and shear constrain vary fundamentally. So with the approach of refined limited component investigation programs which are moderately simple to utilize and have

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noteworthy economy can be utilized as an option for over two strategies.

Direct Design Method:

DDM is extremely easiest and inexact technique for examination of level piece. In this technique add up to minute (M0) is computed and after that it appropriated to add up to Negative Moment and aggregate Positive minute All the Negative and Positive minutes are disseminated in the segment strips and Middle strips individually.

Equivalent Frame Method:

In this technique minutes at each joint is ascertained by Moment Distribution Method utilizing the Fixed End Moment on each traverse. Utilizing those minutes ascertain negative minutes at both left and right help i.e. (Mu-)and the most extreme positive minutes amidst traverse i.e. (Mu+).

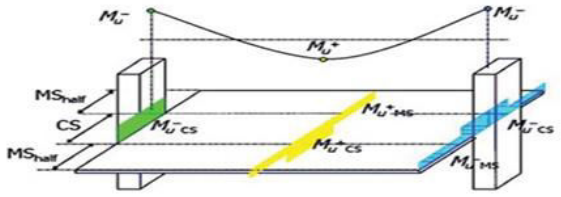

Fig.2.1 Distribution moment to the column strip and middle strip

III.PROBLEM FORMULATION

Examination of level piece of size 5 m X 5 m and 7m X 7m giving drop and segment head. Size of sections is 500mm X 500 mm and live load on the board is 4 kN/m2. Take floor completing burden as 1 kN/m2. UseM20 cement and Fe 415 steel. Chunk is demonstrated utilizing SAFE programming. By utilizing

1) Direct Design Method
2) Equivalent Frame Method

Table 3.1 Description of modelled 5m X 5m Slab

Floor height	3 m
Size of columns	500mm X 500 mm
Depth of slab	170 mm
Depth of drop	220 mm
Size of Drop	2.5mm X 2.5mm
Grade of Concrete	M20
Grade of Steel	Fe 415

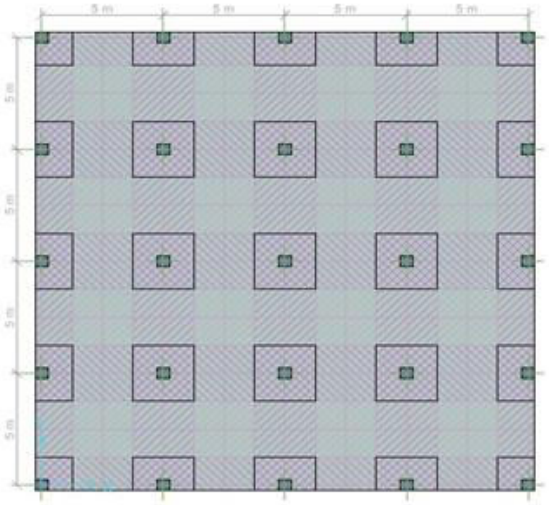

Fig.2.1Plan view of 5m x 5m model

Table 3.2 Description of modelled 7m X 7m Slab

Floor height	3.5m
Size of columns	500mm X 500 mm
Depth of slab	230 mm
Depth of drop	290 mm
Size of Drop	3.5mm X3.5mm
Grade of Concrete	M20
Grade of Steel	Fe 415

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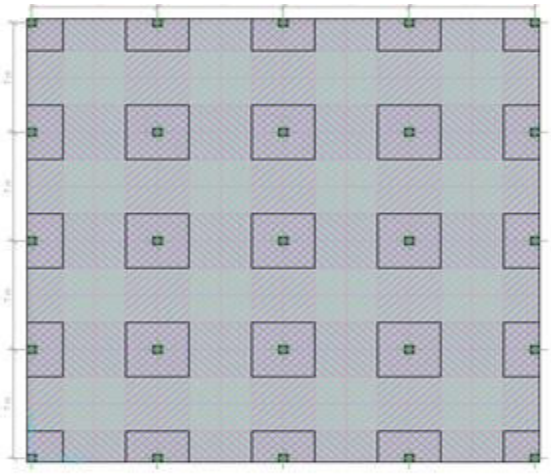

Fig 3.2Plan view of 7m x 7m model

IV.RESULTS AND DISSCUSION

Table 4.1 Results of modelled 5m X 5m Slab For Exterior Panel

Moments	Strip	DDM	EFM	FEM Using SAFE
Positive Moment (Span)	C.S	12.8	18.36	15.03
	M.S	8.53	12.24	12.26
Negative Moment (Interior Support)	C.S	27.6	21.65	18.20
	M.S	9.2	7.216	6.14
Negative Moment (Exterior Support)	C.S	31.71	26.46	27.35
	M.S	0	0	0

Table 4.2 Results of modelled 5m X 5m Slab For Interior Panel

Moments	Strip	DDM	EFM	FEM Using SAFE
Positive Moment (Span)	C.S	11.66	17.04	11.24
	M.S	7.8	11.36	8.09
Negative Moment at Support	C.S	27.1	20.38	37.4
	M.S	9.02	6.79	8.0

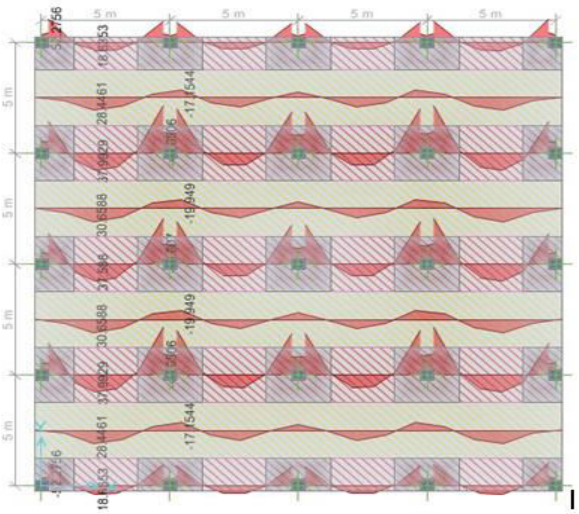

Fig 4.1BMD of 5m x 5m model from SAFE

Table 4.3 Results of modelled 7m X 7m Slab For Exterior Panel

Moments	Strip	DDM	EFM	FEM Using SAFE
Positive Moment (Span)	C.S	31.07	45.6	57.84
	M.S	20.75	30.4	44.08
Negative Moment (Interior Support)	C.S	61.9	50.78	97.08
	M.S	21.1	17	31.29
Negative Moment (Exterior Support)	C.S	59.45	37.5	42.89
	M.S	0	0	0

Moments	Strip	DDM	EFM	FEM Using SAFE
Positive Moment (Span)	C.S	26.1	39.18	36.57
	M.S	17.2	26.12	25.45
Negative Moment at Support	C.S	59.9	46.71	91.42
	M.S	19.75	15.57	31.29

Table 4.4 Results of modelled 7m X 7m Slab For Interior Panel

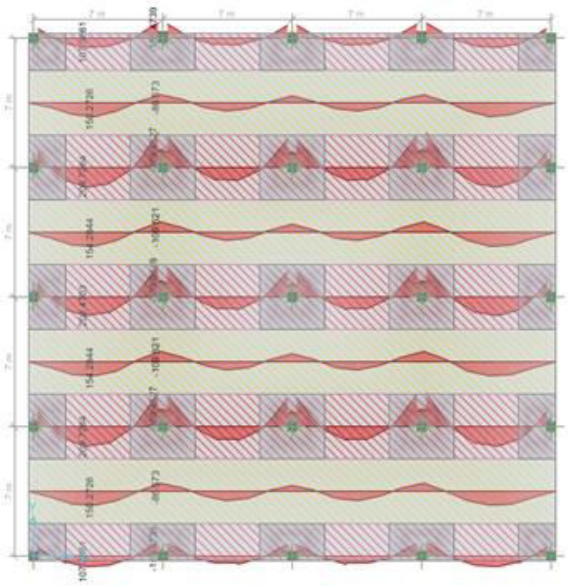

Fig 4.2BMD of 7m x 7m model from SAFE

V.COMPARISON

As contrast with DDM the positive mid-traverse minute is expanding and negative minute is diminishing when chunk is broke down with Equivalent Frame Method. The positive mid-traverse minute is expanding and negative minute is diminishing when section is broke down with Equivalent Frame Method. The negative minute area might be intended to oppose the bigger of

the two inside negative plan minutes for the traverse encircling into basic backings

VI.CONCLUSION

In light of above outcomes and exchanges the accompanying conclusions are drawn,

1.The plan of level chunk by Direct Design Method has a few limitations that (an) It ought to have least three traverses toward every path and (b) It ought not have amazed section introduction. Consequently Equivalent Frame Method is embraced.

2.Both Direct outline strategy and Equivalent casing technique are surmised strategies however comes about acquired from Equivalent casing technique are more exact.

3.The proportionate edge technique isn't palatable for hand figurings. In this manner, utilization of PCs programming which in view of Finite Element Analysis is received.

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