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A REVIEW PAPER FOR STUDY OF RC FRAME STRUCTURE WITH DIFFERENT SHEAR WALL BY CONSIDER SEISMIC ZONE

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ABSTRACT

Now day's the increasing the no of building structures in a country. The construction of multi-story structure with advance construction method and use of advance material to get strength of the country. In this report to be consider of Shear wall with RC frame Structure for a seismic condition is consider. Some seismic condition is like a wind force, earthquake force and some other force is calculate to the construction of a multy story building. Shear wall is component of building, which is getting the strength of structure. Shear wall are resist the lateral force and the other loads like a gravity load, live load, Earth quake load, wind load etc. so, the aspect of this topic is to add the shear wall in a structure in different position with a different building condition is consider to check the results like a maximum story drift, maximum shear force, maximum bending moment, shear story, max story displacement etc. to be consider for an analysis the RC structure. That all criteria should be check and analysis from the Etabs v8. The main objective of the work is to reduce displacement and sway of the structure and construct the building in a long years.so the analysis the G+ 4 building with zone- 3 with consider the loading and check the all condition to be determine as per IS Code.

Keywords-RC-Frame, G+4 Building, IS Code, SF, etc.

I. INTRODUCTION

Shear wall is a reinforced concrete type of a structure which should be a resisting the lateral forces like a wind load, earth quake load and etc. In the high-rise structure which can resist the lateral load by consideration of shear wall. Shear wall is type of structure which is resist the lateral fore and get more strength of building structure. When the high-rise structure with consider of shear wall, an open side is provide with shear wall is less strengthen of structure comparison of close throughout shear structure. So, in open structure is affect to sway force and overturning the structure any time. Shear wall is a good type of structure which can be performed well in a critical condition. So, the position of shear wall with other structure method for a good performance. The applied lateral load force to the building and analysis different of shear wall in RC frame structures. They are different type of analysis like a non linear analysis and linear analysis of example 12 story building to check the all analysis like bending moment, shear moment, shear drift, maximum shear displacement and etc. for a ground level and 12th floor. So the analysis is the, lateral force is more in top of building compare to the base structure. To check the response spectrum analysis and show all graphs to be consider. When use of several codes with reliable technics using in a structure.

Seismic Analysis Methods

The analysis of a structure using different type of methodology for a reduce the seismic force on structure elements to lateral loads which are horizontal movements and loads parallel to x – axis are very necessary. The most important load in lateral load is wind load which affect the long span trusses the most therefore our aim is to study the load and its relation with respect to wind load. Therefore analytical study is our objective. By researching the papers and concluding the information about analytical response of long span roof trusses following work will carry out:-

Static analysis method.

In this method, both type of analysis to the building structure is considered by partially static and partially dynamic methodology to reduce the stress on a structure. For a static analysis, the load is a applied on structure and the structure is not change their behavior can know as a static analysis method. Load on a structure is static with a time and a graph is linear.

Response spectrum analysis method.

In this type of a method is accurate results to the different diagram and graphs to be determine the durability and strength of structure, structure elements with different loading condition

What Is Response Spectrum?

Response spectrum should be used in some nonlinear analysis, dynamic analysis with moment in a structure. Response spectrum analysis is used in a ETABs software and analysis all factored like story drift, maximum story displacement, shear story, moment on building with graph. So, in this method analysis with various graphs and values. Response spectrum method is three types like a;

1) Define the response factor in a structure.
2) Starting of response spectrum with a given history time.
3) Final analysis of response spectrum method on a structure.

- In a vibration of structure can be analysis the graphs and find the frequencies, velocities, acceleration etc. factors should be compare in a ETABs software.
- Find the calculation of the story drift and displacement and other variable on an Etabs software.

Story Drift:-

- Story drift is displacement of two type of story in a divided by height of floor.
- The lateral for acting on a structure and the moment of structure member should be an analysis to the graph and design the structure.
- Story drift is important for a design of a structure.
- To the increasing of size of structural member and the story drift should be reduced.
- So, The story drift calculations is given form the example like a story displacement no is find then the find story drift of levels is X and displacement of X is subtract to the other story displacement level X-1.so; the story drift means the story of 6 minus the story of 5 give the story drift.

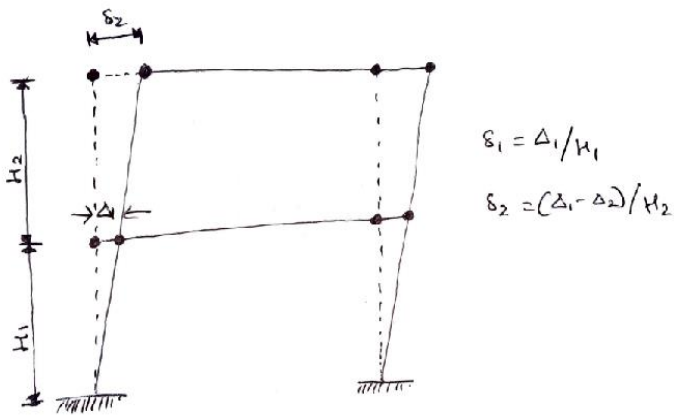

Fig. 1 story drift

II. LITERATURE REVIEW

The first stage for an introduction of the different shear walls with a reinforced concrete structure details are in a literature survey. Literature survey are getting more information for an analysis to the structure.

Roja Mohamadalipar Aski [1] presents that Steel couplings of beam with reinforce concrete wall are proper structure of deep couple of beam.to the studies of reinforcement concrete couple shear wall with the construction of a steel beam to check the seismic performance of the structure. For different story of building, the value is changed as per conditions. They are design the system by two methods.

1) Design based earthquake (DBE)
2) Maximum consider earthquake (MCE)

To the survey of structural steel beam is connect to the wall or a shear wall; it should be highly preferred. RC structure connect with steel reinforcement to connect the walls should be provided. Steel beam is combination of the ductile, stiffness, strength of structure. So, the result of the survey that 1) The RC structure with the steels provided to same drift and same fundamentals period to the height of structure. 2)Seismic performances of the reinforce concrete; couple shear wall with steel is same as pee DBE AND MCB .When the D|C ratio is under the MCE .it should be more to the structure.so; MCE is along highly to the D|C ratio.

Anuaj Chandialia [2] presents that Shear wall is a use of resist the lateral load to the system and to get the more strength to the buildings. That is getting more and more demand of high rise building structure and the structure wall is provide through of the structure to get strength of building. The design of a critical section of a building with size of concrete and steel consumptions of a building member. Which is getting incising with a floors and the requirement of a strength of a structure. The shear wall with a different position provided to get static, ductile, and rigid strength. Cost is more when the increasing with story height to consider a seismic load. Shear wall is type of structure like an open type, couple type, close type and etc. The different method to determine shear wall strength with a static method and dynamic method. All checks and analysis of structure are change with position of shear wall.

P.B.Kodage [3] shows that this paper is a determine for a force consider with a shear wall. The reinforce concrete moment resisting frame structure is consider with a shear wall 3D elements. Shear wall system is most popular and in the high-rise structure to be consider but the use of steel bracing will be a solution of earthquake resisting system. In the

reinforce concrete structure methodology and analysis the threes type of structure.

1) Modal with a type of bracing
2) Modal with a different type of wall

They are increasing the height of structure with the different frame structure with zones and soil structure effect to the building. The frame structure with shear wall design and analysis consideration with a response spectrums method and non-linear analysis method. Aim of system is to reduce the all parameter of analysis to structure element is to reduce a building.

To the different type of analysis of the building structures; the grounds motions is a same to the designee spectrum.to an analysis the story of a building in a zone 4; the ground morion is more. To the analysis the modal of a 1st and 3rd story of modal are in longitudinal and traverse of direction is effect to the structure.so, ground is oscillations is more.

Neraj Patel and Sagar Jamle [4] presented that the system of use a shear wall belt in a optimum height of the structure to carry the lateral load is generated in an earthquake force and a wind force in a high-rise building, towards and etc. The research is done in the field to a lateral load resist system which the various system is analysis against different constraint separately for a sp. Condition and limit. Shear walls and shear cores are in a building against to the different parameter but using of the shear walls to be joint if outrigger bee, system. But they are not analysis till now. Distribute the system, belts is a directly join with core wall and an outriggers to aim of reduce the lateral load, lateral drift on a high-rise building structure. For a no of belts system is provided in outrigger system is reduce the load on structure. When the belts are virtually outriggers in building is a subjects or shear and the shear strength on a shear cracks failure is no applied on it. So; the shear strength of crack are not affect to them.

RESEARCH GAP

The research on a reinforce concrete structure and this material with a shear wall which is use for a resisting if lateral forces on a structure. When the increasing the all details and parameters on a structure .check all parameters and getting accurate results in a ETabs. Story drift, modal period method, story force, load displacements should be check in lateral resisting system with a shear wall using Etabs. The shear wall with opening should be avoided because of reduce the strength of structure.

Objective of Study

- To the analysis RCC structure building and check the purpose of using shear wall in a multy story building.
- Main aim of work is o reducing the displacement of the structure in a presence of earthquake and other lateral force to resist them.
- The reinforce concrete shear wall on an RC building providing in a different location.

Scope of Work

TO the all research of building modals and the main scope is in a reinforce concrete structure with a shear wall resist the lateral force. Lateral force resisting in a terms of a different parameters like a story drift, modal time period, max story displacement,etc for the seismic loading use of a response spectrum method to a top of story. So; check the displacement, axial fore and material consumption with time periods using Etabs.

III. PROBLEM VALIDATION

For the using of the software; all simple type of problem is getting from the search paper" analytical study of shear wall in multi-story building". In this paper design the modal in a ETABs and analysis the different parameter like a story brief, max story displacement and etc. compare the all details and check the structure.

Material Description

TYPE OF FRAME	RC FRAME STRUCTURE
Seismic zone	Zone 2
Number of Story	G+4
Floor height	3m
Depth of slab	175mm
Size of shear wall	300mm
Size of column	300 X 600mm 300 X 450mm
Size of beam	230 X 600mm
Length of structure	11.35m
Materials	M30 concrete,FE 415,FE 500
Density of concrete	24 KN/m2
Types of soil	Medium soil
Seismic zone	As per IS (1893-2016)
Seismic zone factor	0.16
Importance Factor , I	1
Response spectrum analysis's	Linear static analysis

Table 1 material description

SOFTWARE VALIDATION

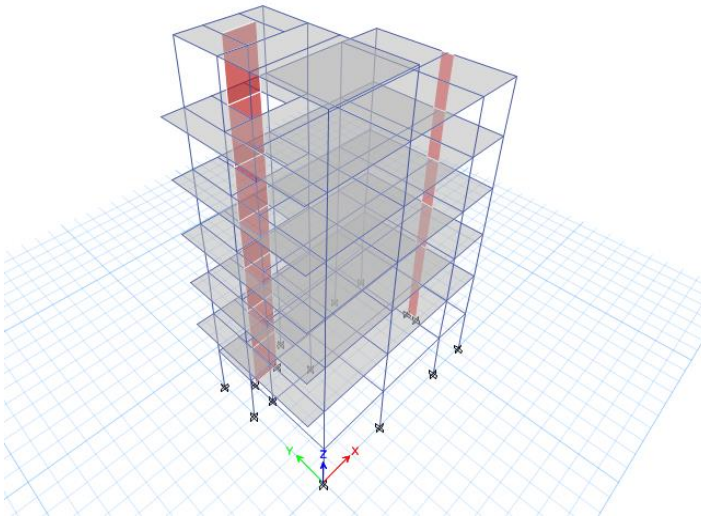

Fig.2 3-D view of building modal

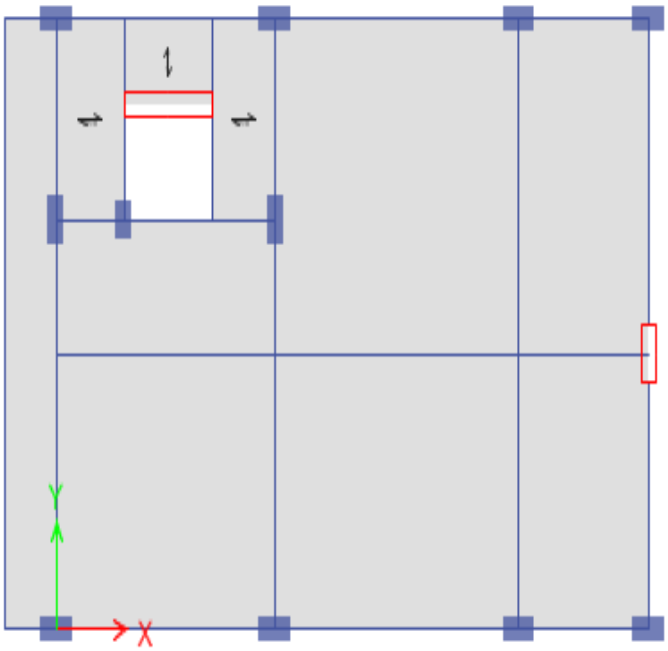

Fig. 3 Plan view of the building

Analysis of Results

Story	Elevation	Location	X-Dir.	Y-Dir.
OHT	21	Top	8.446	3.181
Terrace	18	Top	7.86	3.85
4	15	Top	7.011	3.59
3	12	Top	5.831	3.119
2	9	Top	4.372	2.456
1	6	Top	2.732	1.632
GL	3	Top	1.083	0.68
Base	0	Top	0	0

Table 2 Story displacement

Story	Elevation	Location	X-Dir.	Y-Dir.
	m			
OHT	21	Top	0.000218	0.000073
Terrace	18	Top	0.00029	0.000128
4	15	Top	0.000399	0.000174
3	12	Top	0.00049	0.000226
2	9	Top	0.000548	0.000277
1	6	Top	0.000552	0.000319
GL	3	Top	0.000361	0.000227
Base	0	Top	0	0

Table 3 Story drift

Results Comparison

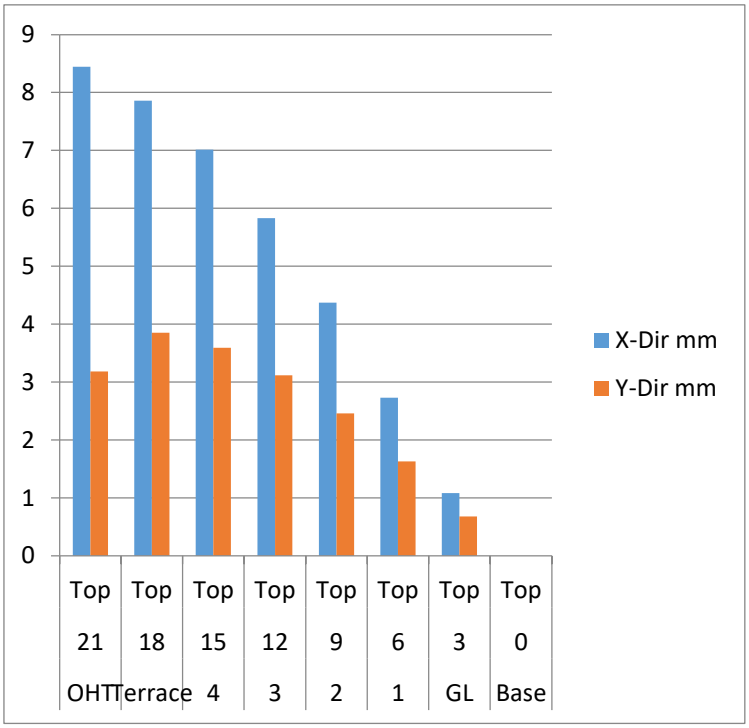

Fig. 4 Story displacement

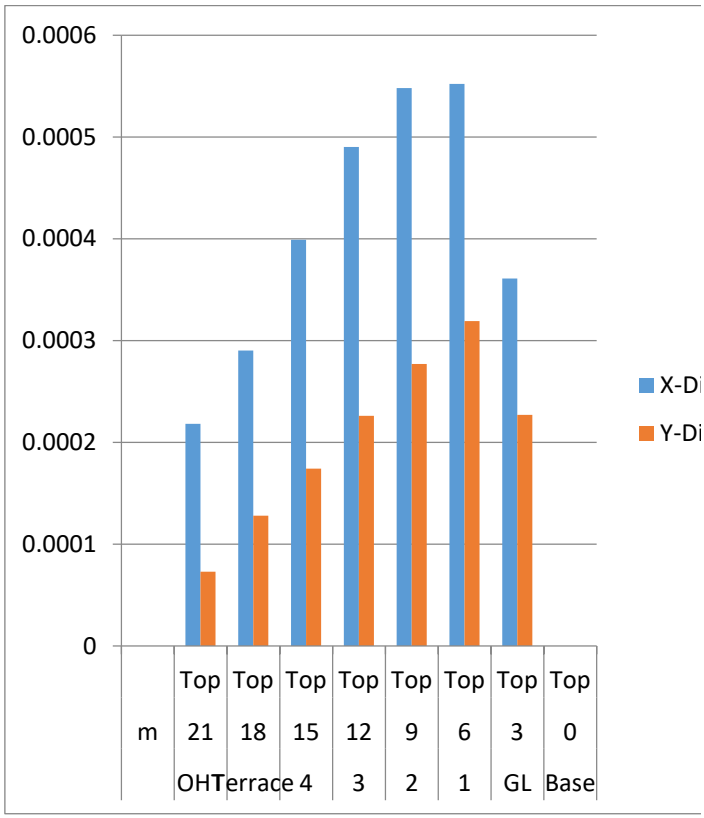

Fig. 5 Story drift

IV. ANALYSIS OF SHEAR WALL WITH RC STRUCTURE

In the Etabs software, analysis of the RC frame structure with shear wall with same height of building model with all structure geometry's.

Response Spectrum Analysis of the Structure in Etabs

The analysis is carried out of the G+4 building structure with different condition like a seismic zone, soil type, geometry of structure etc. This analysis is carried out to the different types of modal and analysis in ETABs software with consideration of IS: 1893, 2016, IS 875, 2015 codes are provided. The plan of structure size is

DESCRIPTION	**DATA VALUE FOR MODALS**
1) **MATERIAL PROPERTY**:	
COLUMN GRADE	FE 415
STEEL GRADE	FE 500
2)**BUILDING DATA**	

Story	G+4
Story height	27.62
Beam size	300 x 600mm 400 x 800mm
Column Size	400 x 800mm
Shearwall Thickness	300mm
Soil type	Medium soil
Seismic zone	Zone 2
Importance factor	
3)Loading Data	
Live load	2 KN/m2
Dead load	3KN/m2
Roof load	1.5Kn/m2
Type of support	Fix

Table 4 data of building

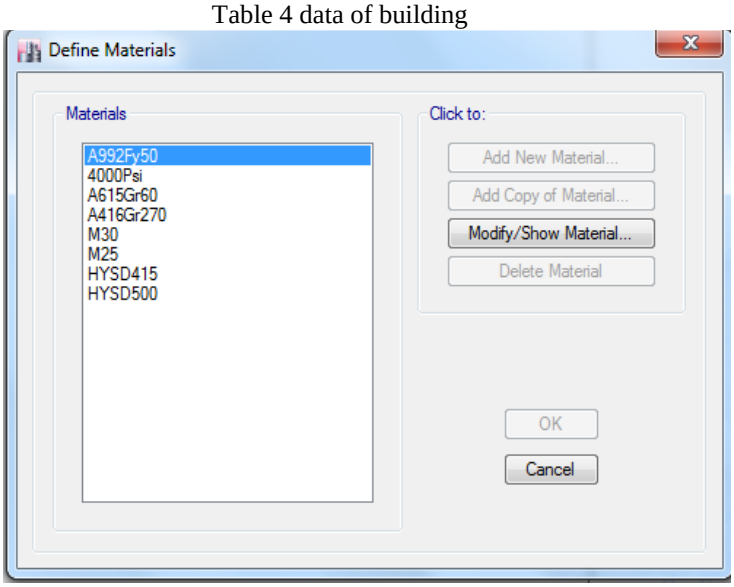

Fig. 6 Define material

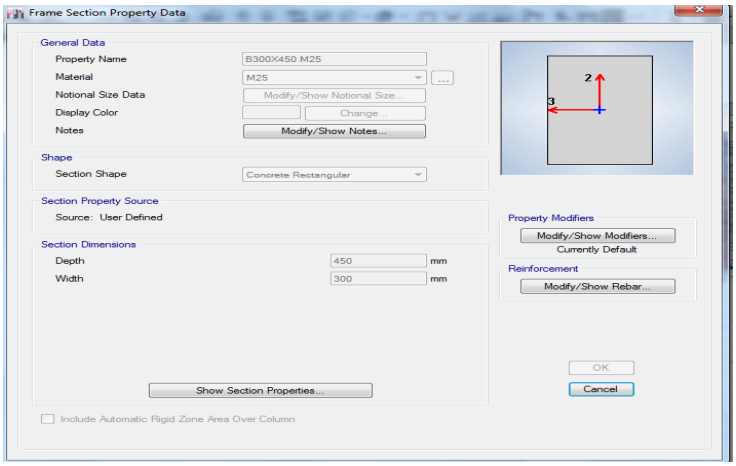

Fig. 7 Frame section property data B1

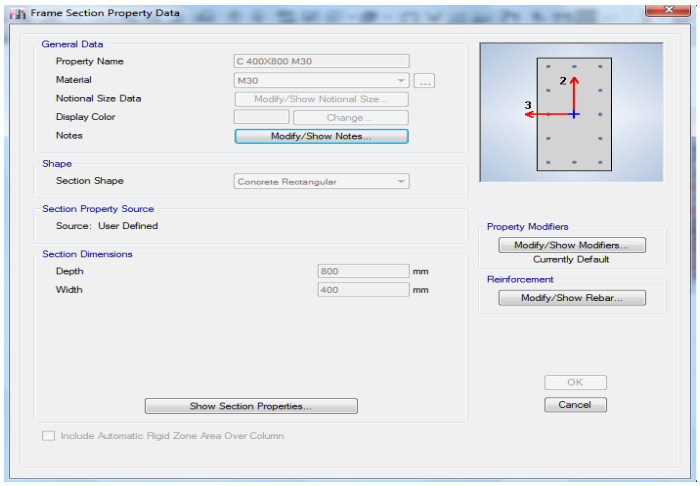

Fig. 8 Frame section property data C1

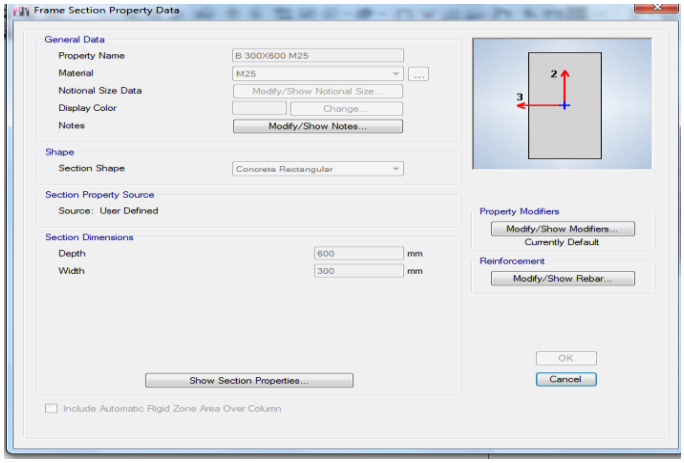

Fig. 9 Frame section property data B2

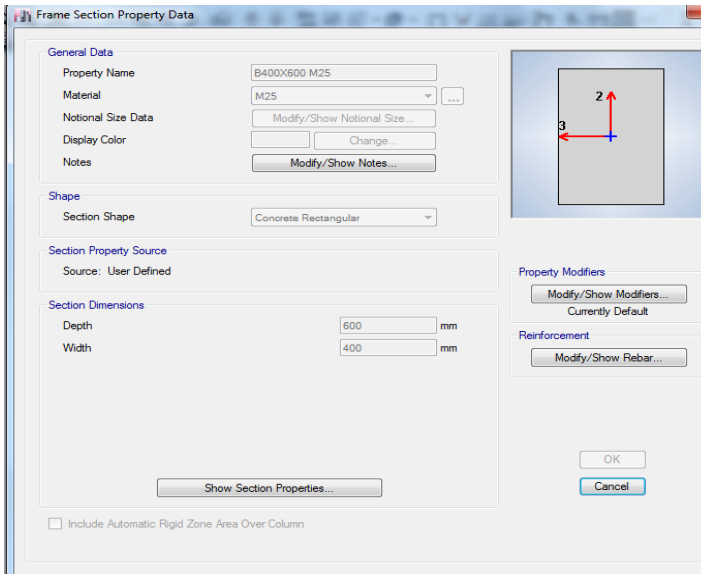

Fig. 10 Frame section property data B3

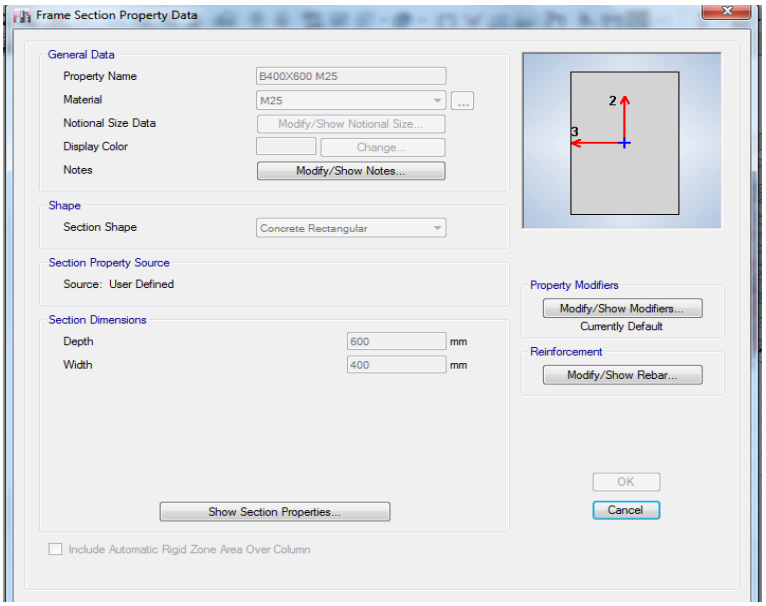

Fig. 11 Frame section property data B4

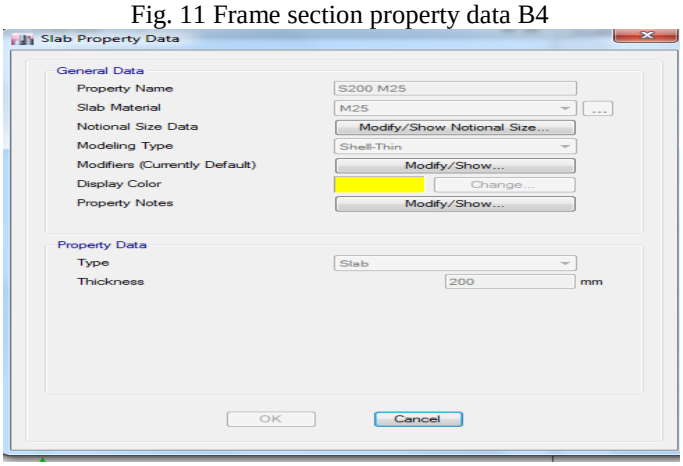

Fig. 12 slab property data

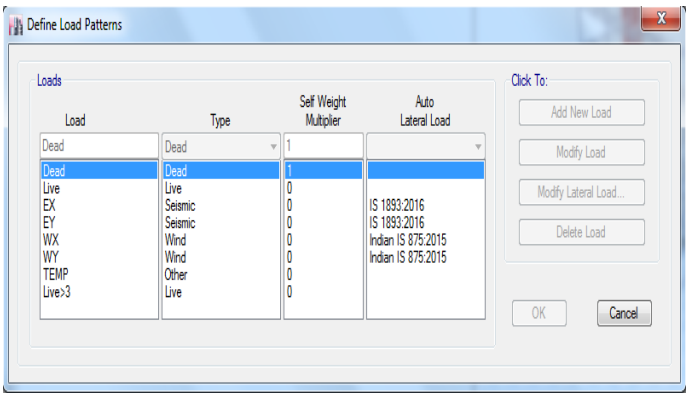

Fig. 13 Define Load Patterns

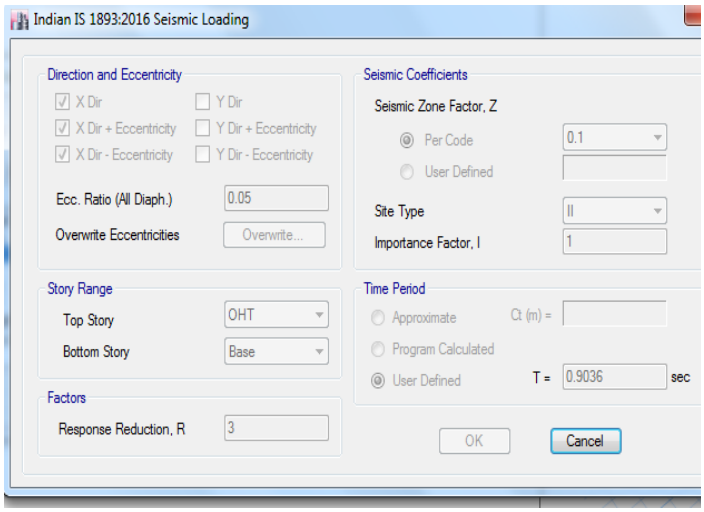

Fig. 14 seismic loading X- directions

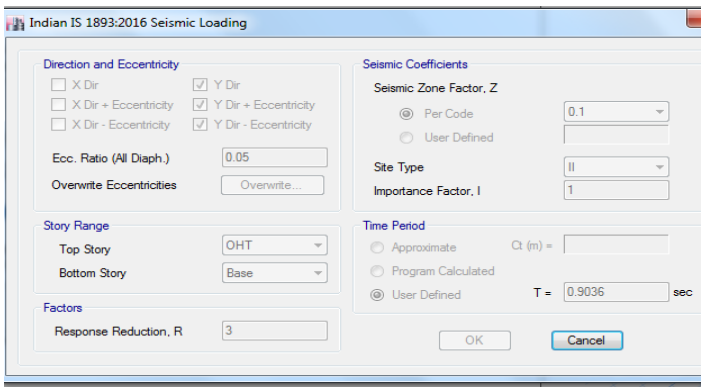

Fig. 15 seismic loading Y directions

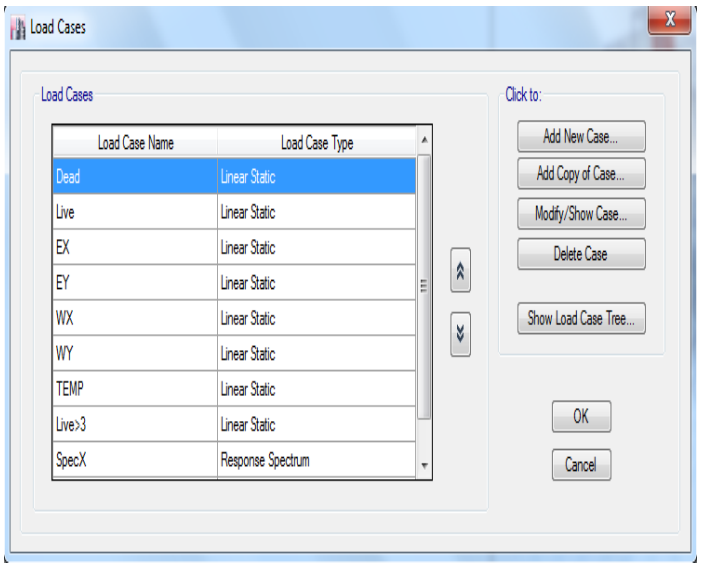

Fig. 16 Load cases

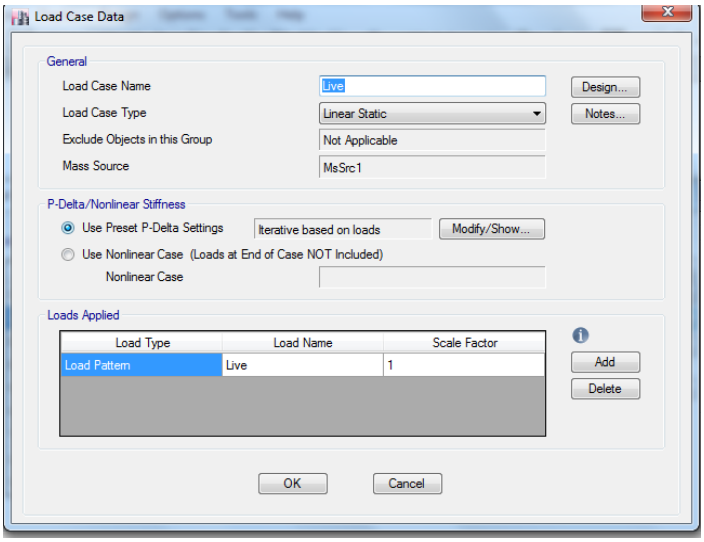

Fig. 17 load cases data for live load

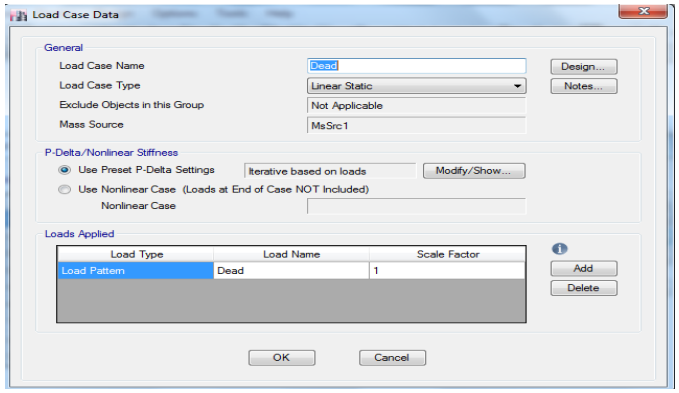

Fig. 18 load cases data for dead load

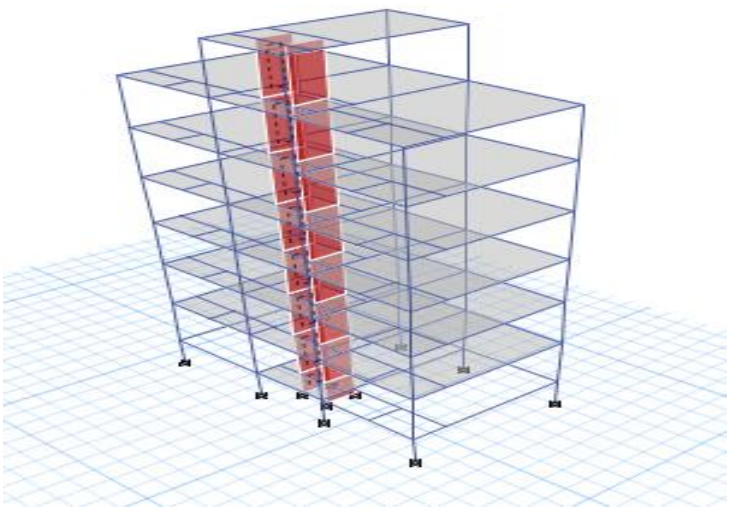

Fig. 19 3d view of G+4 building

V. CONCLUSION

To the conclusion is a different structural modal with graph x-axis and y- axis varies with different locations and change the load and soil condition change the final analysis of structure. To the analysis of above modal that shear wall position are varies in a modals.so the shear wall with opening is less strength compare to the outer modal with a not any opening. They are not any type of overturning moment in a modal otherwise the shear wall is not constricted in a structure because of moment generated in a base. The good position of shear wall is in a modal to the symmetric shear wall with no any moment and reduce the story drift and displacement of structure in a high seismic zonal area. Analysis to the cost for shear wall with c shape or connected shear wall is less cost of construction compare to the individual wall.

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