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ANALYTICAL 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.***

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

1. 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. 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.

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.

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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

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.

2. SOFTWARE VALIDATION

The determination and analysis of story displacement and stoey drift for a RC shear wall structure given below:

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-1 max story displacement of G+4 building

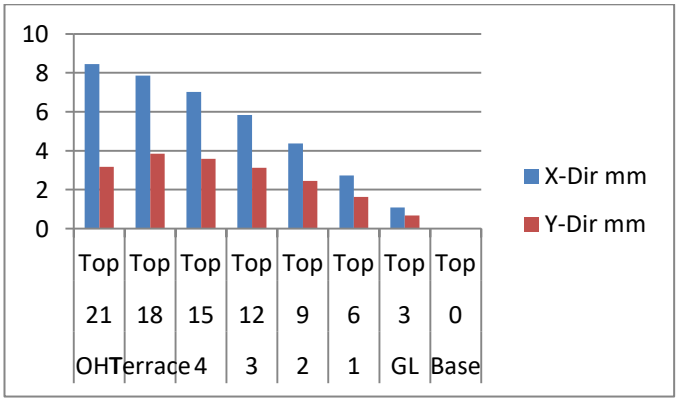

Fig-1 max. Story displacement g+4 building

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-2 max story drift of G+4 building

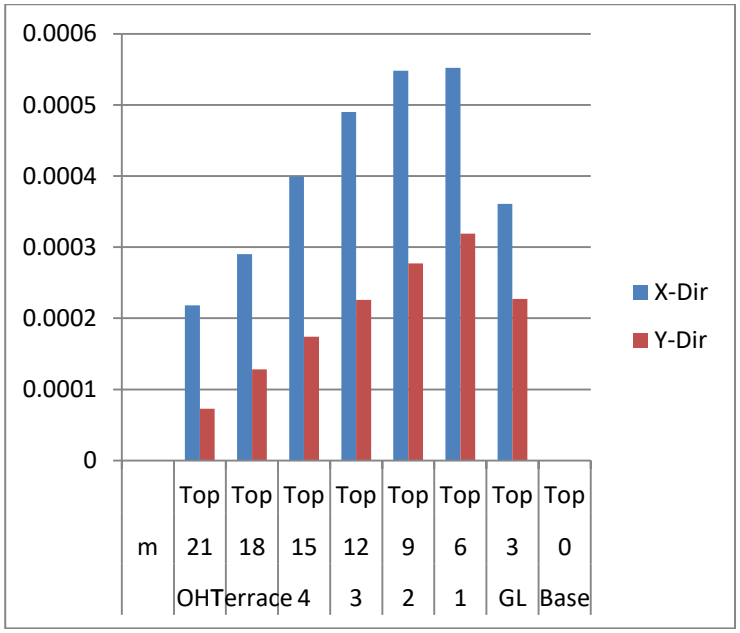

Fig-3 max story drift of G+4 building

Story	Elevation	Location	X-Dir.	Y-Dir.
	m		mm	mm
OHT	15	Top	3.127	1.57
Terrace	12	Top	5.534	2.4
2	9	Top	4.072	1.876
1	6	Top	2.38	1.175
GL	3	Top	0.812	0.458
Base	0	Top	0	0

Table-3 max story displacement of G+2 building s.w

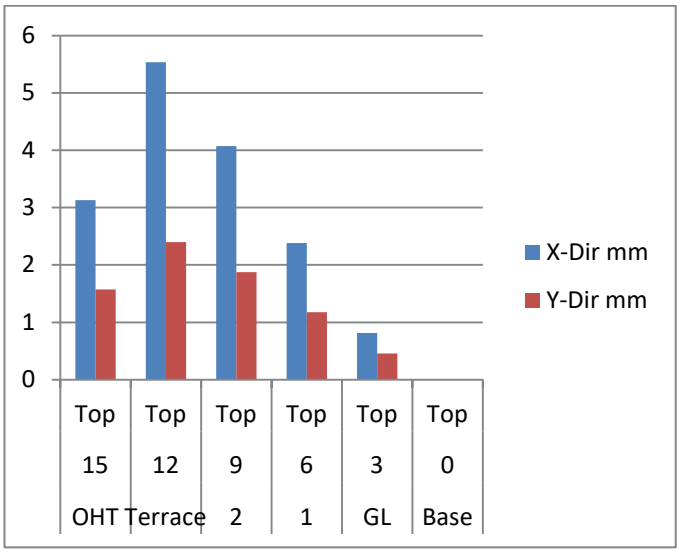

Fig -4 max story displacement of G+2 building s.w

Story	Elevation m	Location	X-Dir.	Y-Dir.
OHT	15	Top	0.000208	0.000082
Terrace	12	Top	0.00049	0.000175
2	9	Top	0.000565	0.000234
1	6	Top	0.000525	0.000242
GL	3	Top	0.000271	0.000153
Base	0	Top	0	0

Table-4 max story drift of G+2 building s.w 1

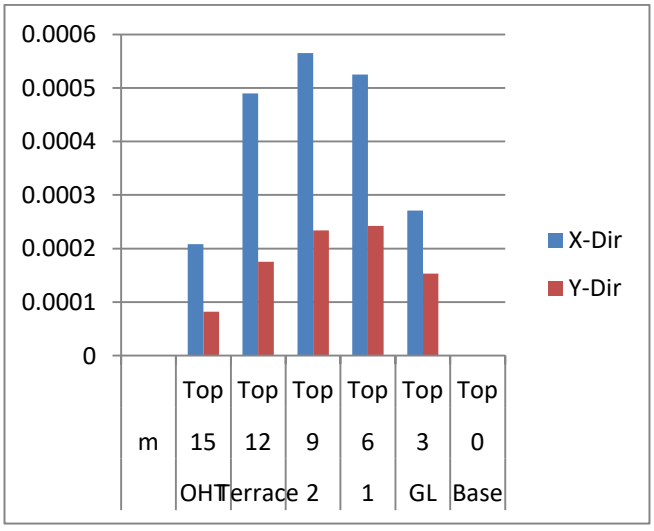

Fig-5 max story drift of G+2 building s.w

Story	Elevation m	Location	X-Dir. mm	Y-Dir. mm
OHT	24	Top	11.345	6.251
Terrace	21	Top	15.681	5.85
5	18	Top	14.357	5.407
4	15	Top	12.533	4.763
3	12	Top	10.213	3.929
2	9	Top	7.504	2.944
1	6	Top	4.575	1.857
GL	3	Top	1.701	0.726
Base	0	Top	0	0

Table-5 max story displacement of G+5 building s.w

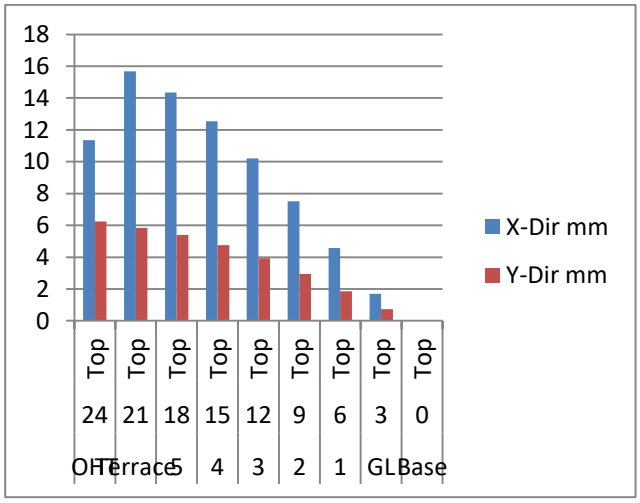

Fig-6 max story displacement of G+5 building s.w

Story	Elevation m	Location	X-Dir	Y-Dir
OHT	24	Top	0.000312	0.000147
Terrace	21	Top	0.000452	0.000152
5	18	Top	0.000619	0.000219
4	15	Top	0.000782	0.000281
3	12	Top	0.000909	0.00033
2	9	Top	0.000978	0.000363
1	6	Top	0.000894	0.000377
GL	3	Top	0.000567	0.000242
Base	0	Top	0	0

Table-6 max story drift of G+5 building s.w

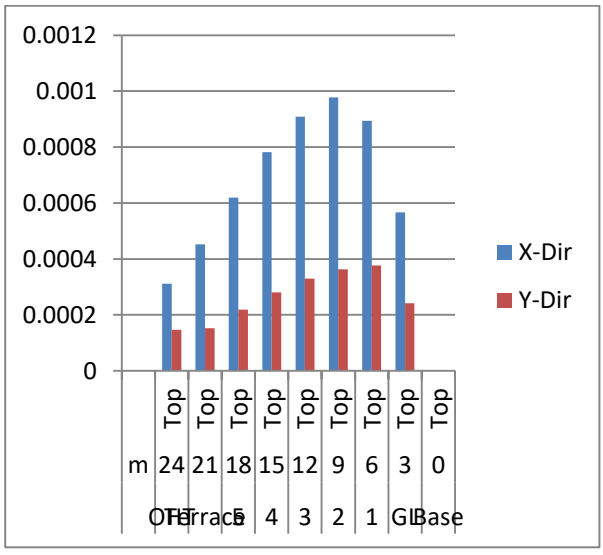

Fig-7 max story drift of G+5 building s.w

Story	Elevation	Location	X-Dir.	Y-Dir.
	m		mm	mm
OHT	23.2	Top	23.106	1.285
Terrace	20.3	Top	22.172	4.017
5	17.4	Top	20.773	3.646
4	14.5	Top	18.563	3.155
3	11.6	Top	15.574	2.537
2	8.7	Top	11.921	1.819
1	5.8	Top	7.743	1.058
GL	2.9	Top	3.201	0.378
Base	0	Top	0	0

Table-7 max story displacement of G+5 building m

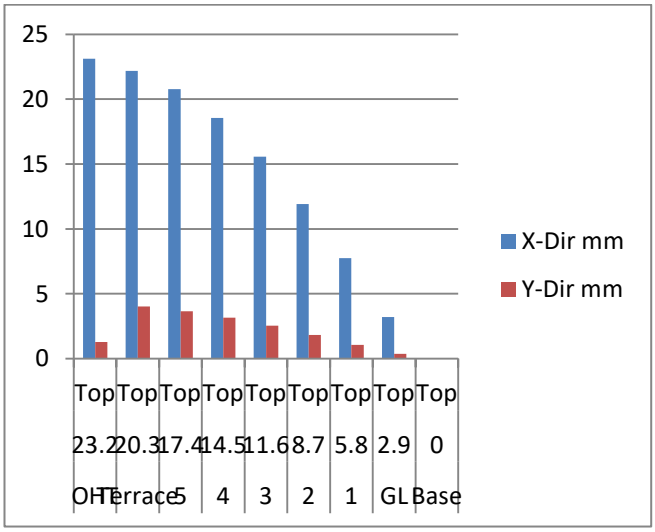

Fig-8 max story displacement of G+5 building m

Story	Elevation	Location	X-Dir.	Y-Dir.
	m			
OHT	23.2	Top	0.000504	0.000052
Terrace	20.3	Top	0.000519	0.00013
5	17.4	Top	0.000803	0.000171
4	14.5	Top	0.001064	0.000214
3	11.6	Top	0.001278	0.000248
2	8.7	Top	0.001447	0.000263
1	5.8	Top	0.001568	0.000236
GL	2.9	Top	0.001098	0.00013
Base	0	Top	0	0

Table-8 max story drift of G+5 building m

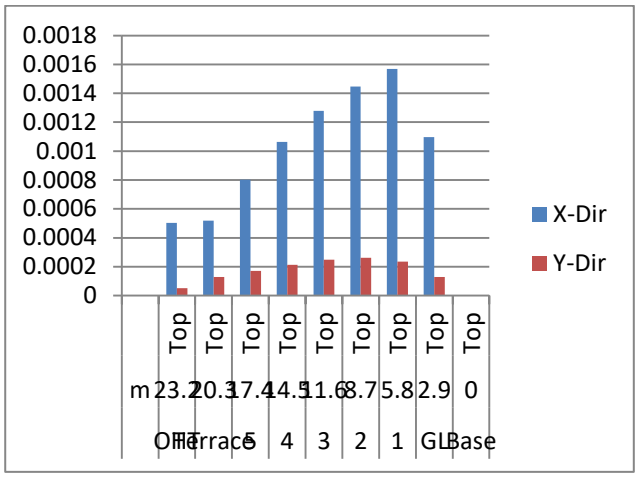

Fig-9 max story drift of G+5 building m

Story	Elevation	Location	X-Dir	Y-Dir
	m		mm	mm
STAIR CABIN	32	Top	38.567	23.326
TERRACE	29	Top	39.557	29.923
6	26	Top	37.105	28.718
5	23	Top	33.546	25.968
4	20	Top	29.503	22.796
3	17	Top	24.999	19.255
2	14	Top	20.108	15.421
1	11	Top	14.93	11.397
G.F.	8	Top	9.693	7.383
BASEMENT	5	Top	4.725	3.602
PLINTH	2	Top	1.137	0.86
Base	0	Top	0	0

Table-9 max story displacement of G+6 building

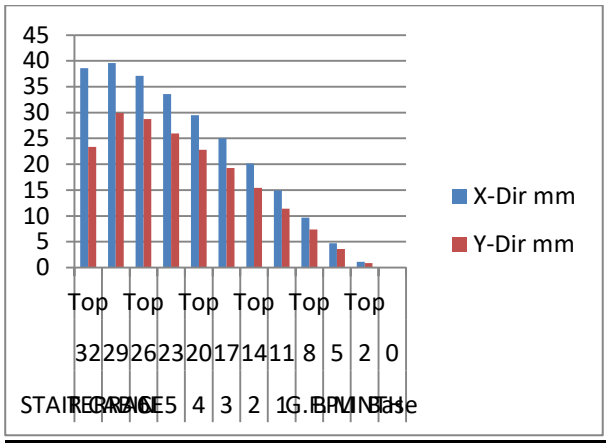

Fig-10 max story displacement of G+6 building

Story	Elevation	Location	X-Dir	Y-Dir
	m			
STAIR CABIN	32	Top	0.001047	0.000604
TERRACE	29	Top	0.001182	0.000824
6	26	Top	0.001326	0.000985
5	23	Top	0.001469	0.001119
4	20	Top	0.001588	0.001221
3	17	Top	0.001675	0.001289
2	14	Top	0.001735	0.001325

1	11	Top	0.00173	0.001303
G.F.	8	Top	0.001597	0.001167
BASEMENT	5	Top	0.001208	0.000918
PLINTH	2	Top	0.000569	0.00043
Base	0	Top	0	0

Table-10 max story Drift of G+6 building

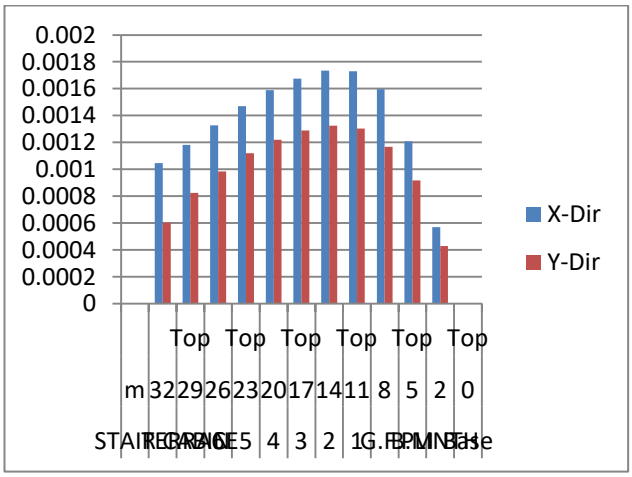

Fig-11 max story Drift of G+6 building

3-D DESIGN ANALYSIS

3D view of RC structure with shear wall design:

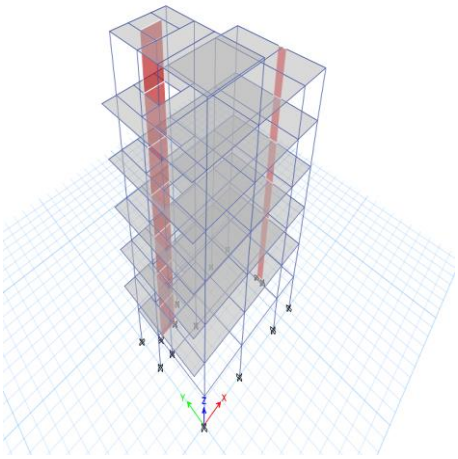

Fig -12 View of g+4 structure

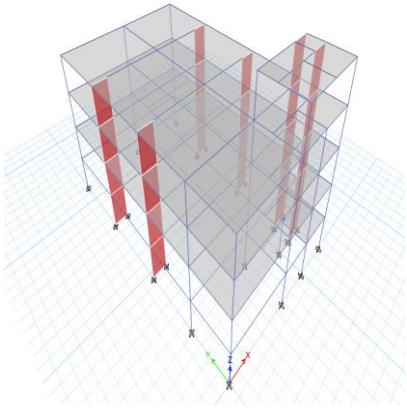

Fig -13 view of g+2 structure

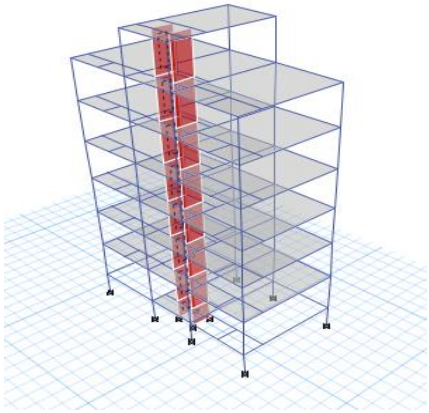

Fig-14View of g+4 structure

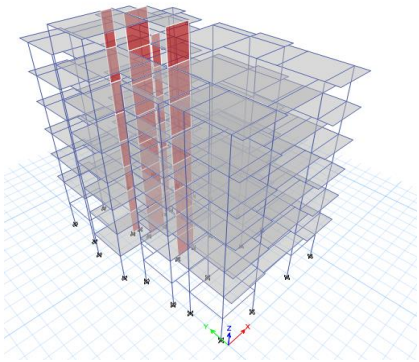

Fig -15 View of g+5 structure

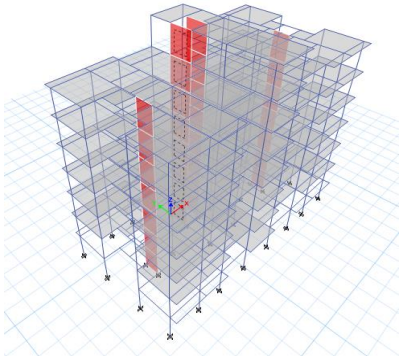

Fig-16 View of g+ 5 m structure

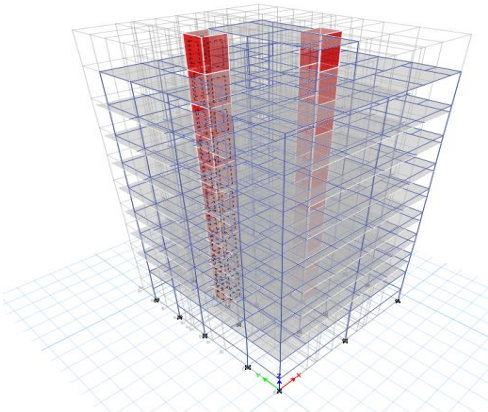

Fig 17- Vied of g+6 structure

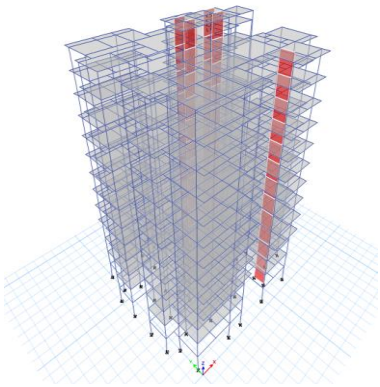

Fig-18 View of g+9 structure

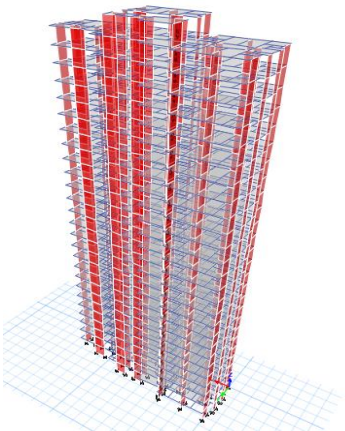

Fig-19 View of g+24 structure

4. 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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