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Comparison of Seismic Behaviour of RCC Building in ZONE-II and ZONE-V

A.Sravani Devi, P.Rajesh

P.G. Student, Department of civil engineering, St.mary's group of institutions, Guntur, Andhra Pradesh, India
Assistant Professor, Department of civil engineering, St.mary's group of institutions, Guntur, Andhra Pradesh, India

ABSTRACT: Many of the homes in India are built in earthquake zones. Designing a building is one of this way that lowering harm at some stage in an earthquake makes the shape pretty uneconomical, as the earthquake might or may not arise in its existence time and is an extraordinary phenomenon. Many researchers had been conducted on this subject matter and nonetheless it's far continuing, due to the fact more we attempt to research more we are able to reduce the damages and save the lives. According to studies had been made at the seismology about 90% earthquake happens due to tectonics. If we come to civil engineering an engineer's activity is to offer most safety inside the structures designed and hold the financial system. The state-of-the-art version of seismic zoning map of India given inside the earthquake resistant layout code of India [IS 1893 (Part 1) 2002] assigns 4 stages of seismicity for India in terms of zone factors. In other phrases, the earthquake-zoning map of India divides India into 4 seismic zones (Zone 2, three, four and five) in contrast to its preceding version, which consisted of 5 or six zones for the nation. According to the present zoning map, Zone 5 expects the highest degree of seismicity while Zone 2 is related to the lowest level of seismicity. In this paper a G+5 current RCC framed shape has been analysed and designed the use of ETABS. The building is designed as in keeping with IS 1893(Part 1):2002 for earthquake forces in one of kind seismic zones. The most important goals of the paper are to evaluate the version of most shear force, most bending second, and most deflection in specific seismic region. Variations are drastically better from area II to zone V. The most shear force, most bending moment, most deflection is increases from quarter II to quarter V.

I. INTRODUCTION

The behaviour of a building at some point of earthquakes relies upon significantly on its universal shape, size and geometry, similarly to how the earthquake forces are carried to the floor. The earthquake forces developed at extraordinary floor degrees in a construction want to be brought down alongside the height to the floor by using the shortest route; any deviation or discontinuity on this load switch direction outcomes in poor overall performance of the construction. Buildings with vertical setbacks (like the hotel buildings with some storeys wider than the rest purpose an unexpected soar in earthquake forces at the level of discontinuity. Buildings which have fewer columns or partitions in a specific storey or with unusually tall storey tend to harm or collapse that's initiated in that storey. Many buildings with an open ground storey meant for parking collapsed or were significantly damaged in Gujarat in the course of the 2001 Bhuj earthquake. Buildings with columns that hold or drift on beams at an intermediate storey and do no longer cross all of the way to the foundation have discontinuities in the load switch direction.

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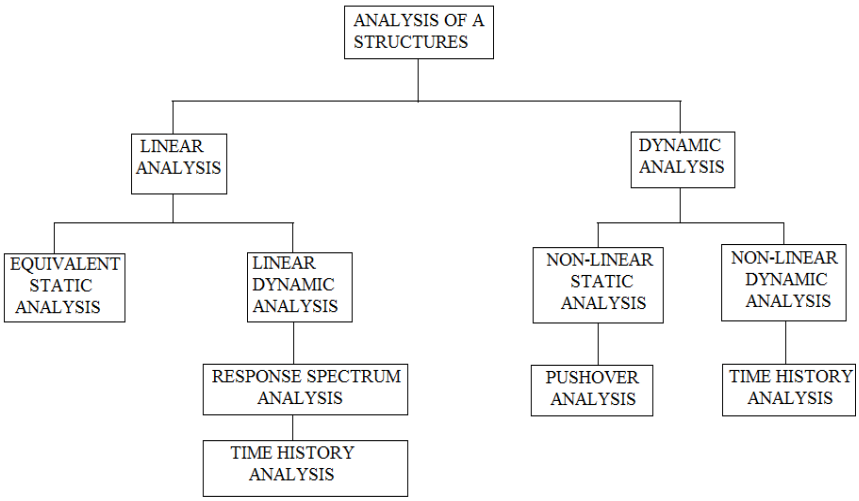
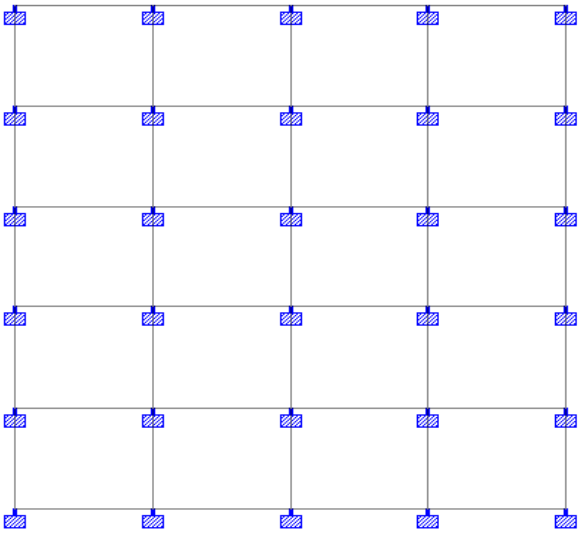
II. ANALYSIS



III. MODELLING

Considered the two structures in ZONE-II AND ZONE-V. in this thesis two structures are compared in the parameters like shear force, bending moment, storey shear, storey drift and time period of vibration of structures.

1. RCC building in ZONE-II
2. RCC building in ZONE-V



PLAN OF RCC BUILDING IN ZONE-II AND ZONE-V

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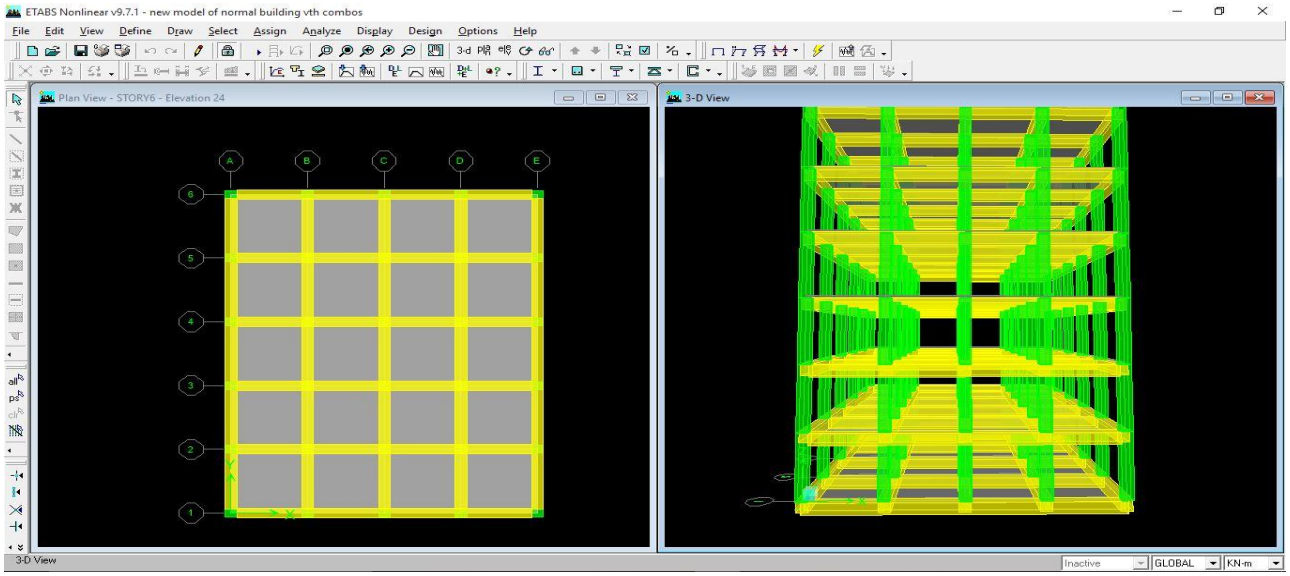

MODELLING OF RCC BUILDING IN ZONE-II AND ZONE-V

IV. RESULTS

TIME PERIOD

Mode	TIME PERIOD, sec	
	Structure 1	**Structure 2**
1	0.748805	0.718067
2	0.716476	0.688549
3	0.679217	0.676532
4	0.248726	0.237397
5	0.237629	0.223912
6	0.223729	0.221413
7	0.148121	0.148392
8	0.14167	0.139794
9	0.130832	0.133734
10	0.107666	0.133115
11	0.102209	0.111762
12	0.093573	0.11094

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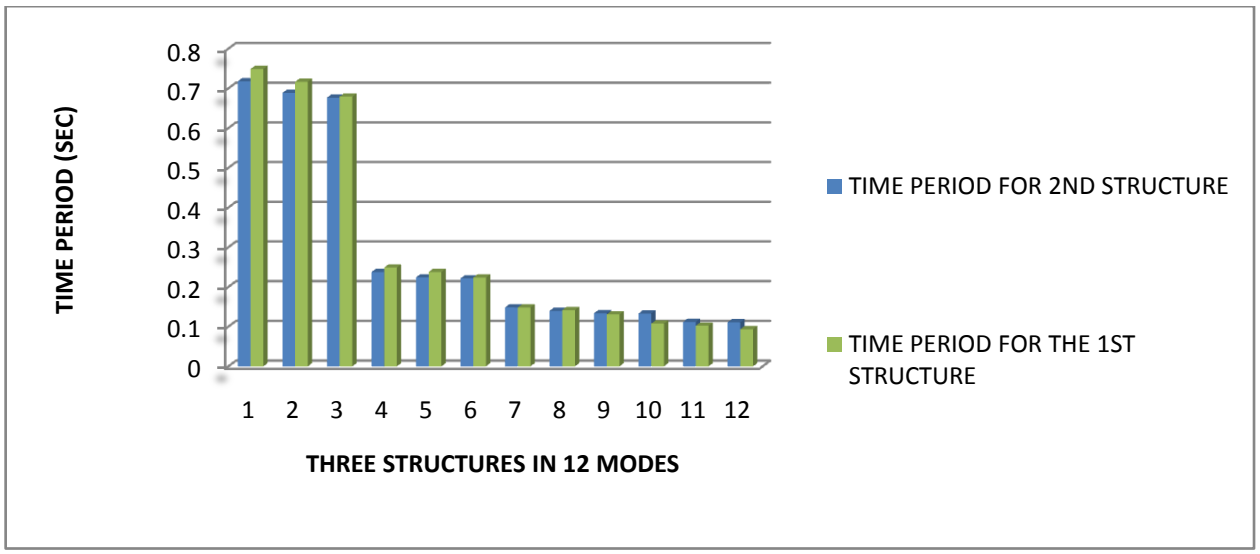

STOREY DRIFT

Storey	STOREY DRIFT	
	Structure 1	**Structure 2**
Storey 6	0.004841	0.00045
	0.000111	0.000166
Storey 5	0.0088	0.000563
	0.000187	0.000214
Storey 4	0.000653	0.000642
	0.000253	0.000254
Storey 3	0.016828	0.000669
	0.016828	0.001004
Storey 2	0.000332	0.000658
	0.020542	0.000293
Storey 1	0.000664	0.000585
	0.021484	0.000878

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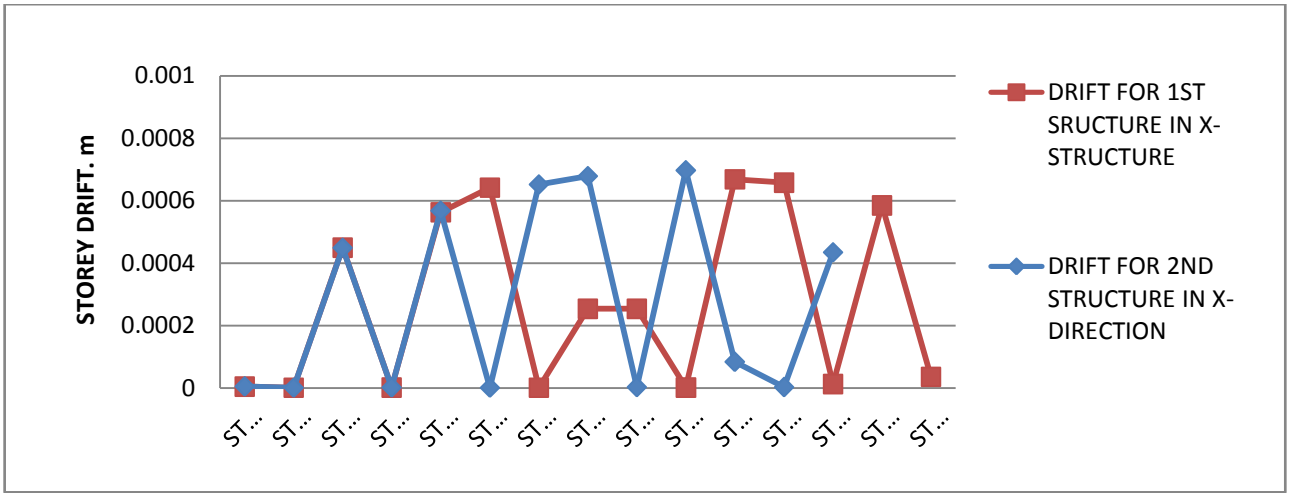
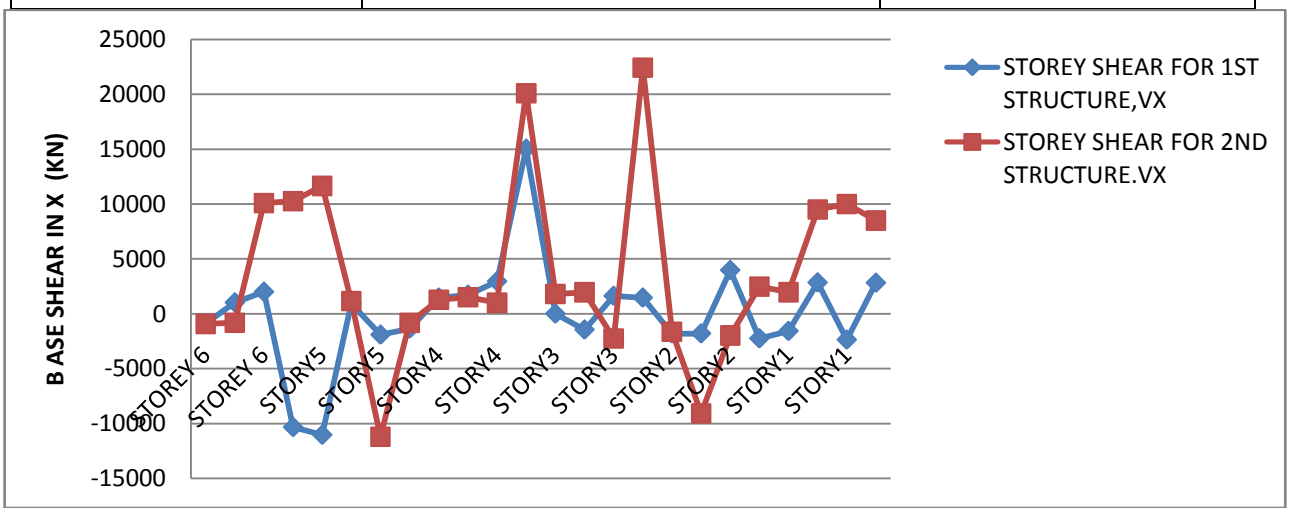


STOREY SHEAR FORCE

Storey	STOREY SHEAR FORCE,KN	
	Structure 1	Structure 2
Storey 6	-1232.4	313.99
	796.2	-1339.49
Storey 5	-1400.48	-1144.05
	420.27	423.59
Storey 4	-1787.22	1450
	14972	15023.24
Storey 3	848	0
	539.44	618.07
Storey 2	960.58	-1805.97
	1101.45	1805.97
Storey 1	425.62	741.5
	2125.62	2212.25



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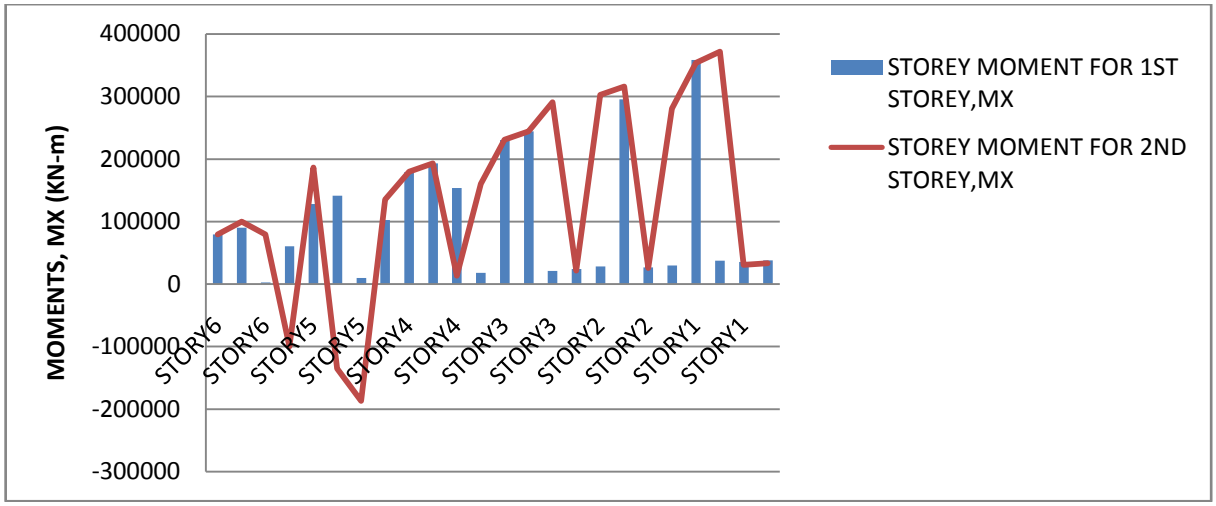
STOREY MOMENTS

Storey	STOREY MOMENTS	
	Structure 1	**Structure 2**
Storey 6	71289.14	90272.38
	-71289.1	2879.993
Storey 5	126112	128134.8
	109690.5	141574.8
Storey 4	153568	179437.2
	169690.3	192877.2
Storey 3	251024	230739.6
	-275645	21111.21
Storey 2	128480	282042
	1180.654	26869.91
Storey 1	130494	358694.4
	111827.32	372134.4



V. CONCLUSIONS

This study presented in the behaviour of the building between the RCC BUILDING IN ZONE II and ZONE-V. The following conclusions were drawn based on the investigation

1) It was observed that RCC building in ZONE-II has more time period than that of RCC building in ZONE-V because of the decreasing of the stiffness.
2) The displacement of building increases from lower zones to higher zones, because the magnitude and intensity will be more for higher zones, similarly for drift, because it is related with the displacement.
3) By the calculation of storey drift at each floor for the two buildings it is observed that RCC building in ZONE-II will suffer extreme storey drift than that of the RCC building in ZONE V
4) The RCC building in ZONE-II experienced more storey shear than that of the RCC building in ZONE II.

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5) It was observed that the RCC building in ZONE-II is increases in base shear when compared with the base shear in ZONE-V.

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