

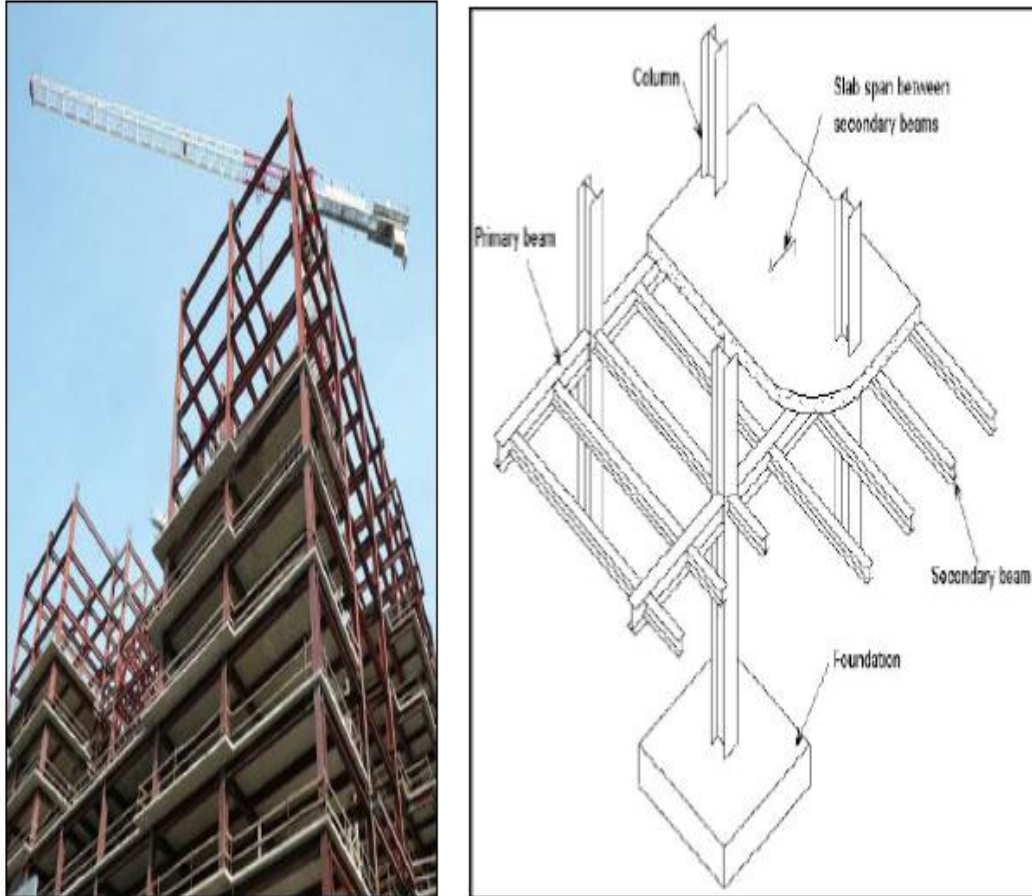
**COMPARATIVE ANALYSIS OF REINFORCED CONCRETE &
COMPOSITE STRUCTURES SUBJECTED TO STATIC & DYNAMIC
LOADS**MOHAMMED IMRAN¹, SHAIK ABDULLA², S.M.HASMI³¹P.G. Student, Department Of Civil Engineering, KBN Engineering College, Kalaburagi, Karnataka, India²Assistant Professor, Department Of Civil Engineering, KBN Engineering College, Kalaburagi, Karnataka, India³Head Of Department Of Civil Engineering, KBN Engineering College, Kalaburagi, Karnataka, India

Abstract — Steel-Concrete composite developments are these days winding up plainly extremely main stream attributable to their favorable circumstances over customary Concrete and Steel developments. concrete structures are massive and bestow more seismic weight and less avoidance while Steel structures teach more deflection and ductility to the structure, which is valuable in opposing earthquake strengths. Composite Construction consolidates the better properties of both steel and concrete. Therefore the point of present investigation is to look at seismic execution of G+6, G+12, G+18 without shear wall and G+18 with shear wall for reinforced concrete and composite structures arranged in quake zone III. All frames are design under same gravity loading. Response spectrum method is used for investigation seismic examination. E-tabs programming is utilized and the outcomes are thought about. Relative examination presumes that composite structures are most appropriate in opposing seismic strengths contrasted with that RCC structures. These structures are most appropriate in range of high seismic powers. Starting investment in composite structures is high contrasted with that of RC structures from material cost perspective.

Keywords-base shear, displacement, column axial force, beam moments, column moments

I. INTRODUCTION

In India the majority of structures drop beneath the classification of small ascent structures. In this way, used of this structure RCC member be used extensively for the reason that development turns out to be very helpful and efficient within environment. Except, because the people in urban areas is developing exponentially as well as the property is constrained, vertical development is very necessary of structures in urban communities. In this way, for the satisfaction of this reason countless to tall structures are coming up nowadays. For these elevated structures it have discovered with the aim of utilization of composite individuals in development greater successful also financial than utilizing RCC member. Prominence of steel concrete combined development in urban communities can be remaining further bolstering its good fortune above the traditional fortified R.C development. RC casings have been utilized as a part of low ascent structures since loading is minor. However, in medium and tall structures, the ordinary reinforced concrete development can't be received as there is expanded dead load alongside traverse confinements, less solidness and system which is very helpless against risks. The utilization steel in development manufacturing less India compare with numerous creating nations. Encounters of different nations show not because of the absence of financial system of Steel as a development material. There is an incredible prospective intended for expanding amount of Steel within development, particularly within present advancement desires within India. Not investigating Steel the same as an optional development material in addition to that not utilizing everywhere prudent is overwhelming misfortune for the nation. Likewise, now days it is clear, the composite areas utilizing Steel with Concrete are prudent, cost and time powerful arrangement in major common construction, for example, bridges and tall structures. In due thought of the above reality, this venture has been imagined which comprises of analysis of an tall structure utilizing Steel-Concrete composite choice.



T Fig -1 Typical Composite Structure & Its Components

II. MATHEMATICAL FORMULATION

A (G+12) storied structure for R.C, and composite structure is considered and Response spectrum method & equivalent static method of analysis is used.

Table-1 Data for analysis

SNO	Parameters	Values
1	Material used	Concrete-M20 Reinforcement Fe-500 Structural steel 250-Mpa
2	Plan Dimension	(20mx20m)
3	Height of each Storey	3.2m
4	Density of concrete	25KN/m ³
5	Density of masonry	20KN/m ³
6	Seismic zone	III
7	Importance Factor	1
8	Response Reduction Factor	5
9	Foundation soil	Hard
10	Slab thickness	150mm
11	Wall thickness	230mm
12	Floor Finish	1KN/m ²
13	Live load	3 KN/m ²
14	Earthquake load	As per IS 1893-2002

Fig 2 Plan of buildings

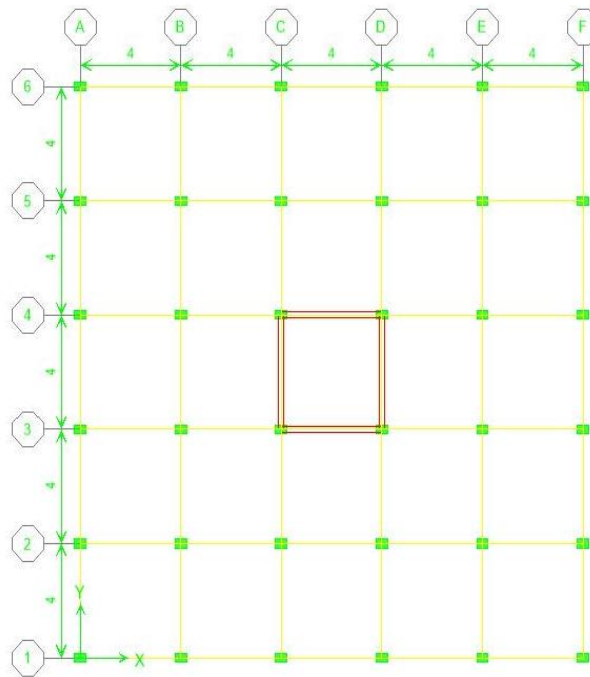


Table -2 Variation of base shear

	Direction	ZONE	R.C.C.	Composite
G+12	EQx	III	768.77	456.89
	EQy		715.67	421.05

Fig – 3 Graph for base shear

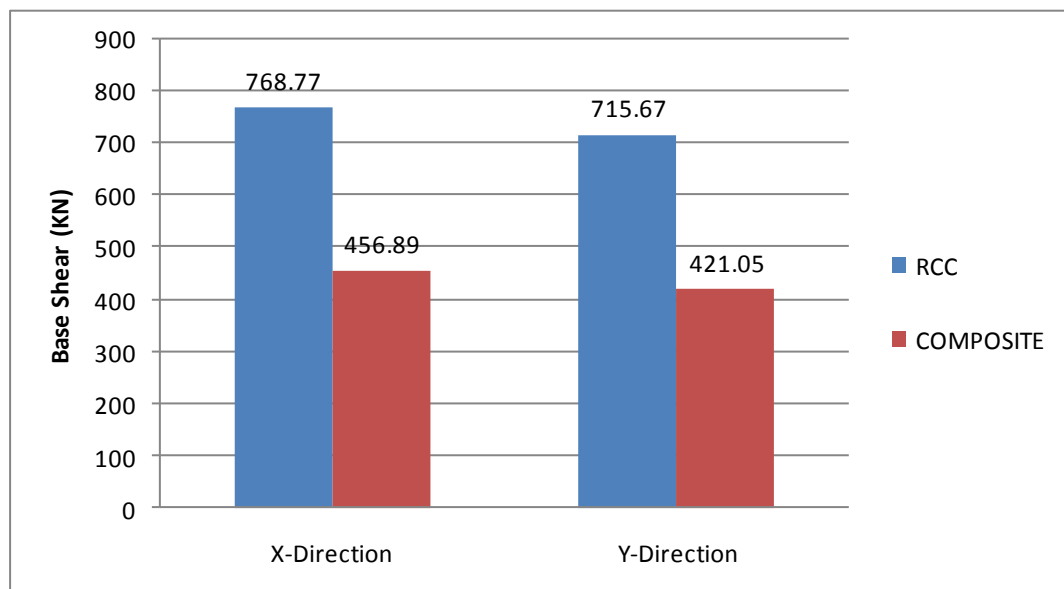


Table-3 Variation of displacement

Displacement(mm)		
Story No	R.C.C.	Composite
14	16.6742	21.9881
13	15.4552	20.0580
12	14.1649	18.0809
11	12.8047	16.0682
10	11.3778	14.0307
9	9.8982	11.9898
8	8.3885	9.9742
7	6.8777	8.0194
6	5.4010	6.1661
5	3.9991	4.4595
4	2.7181	2.9491
3	1.6101	1.6880
2	0.7346	0.7328
1	0.1425	0.1344

Fig -4 Graph for displacement

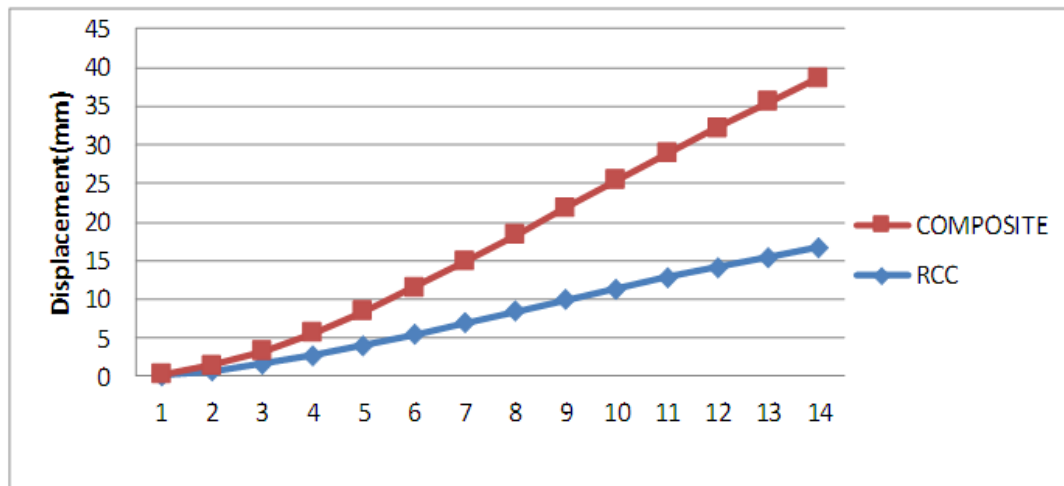


Table -4 Variation of column axial force (KN)

Column forces.		
G+12		
Column	R.C.C.	Composite
Corner column	2592.64	1836.99
Side column	3560.63	2845.24
Inner column	3922.35	3640.76

Fig -5 Graph for column axial force (G+12)

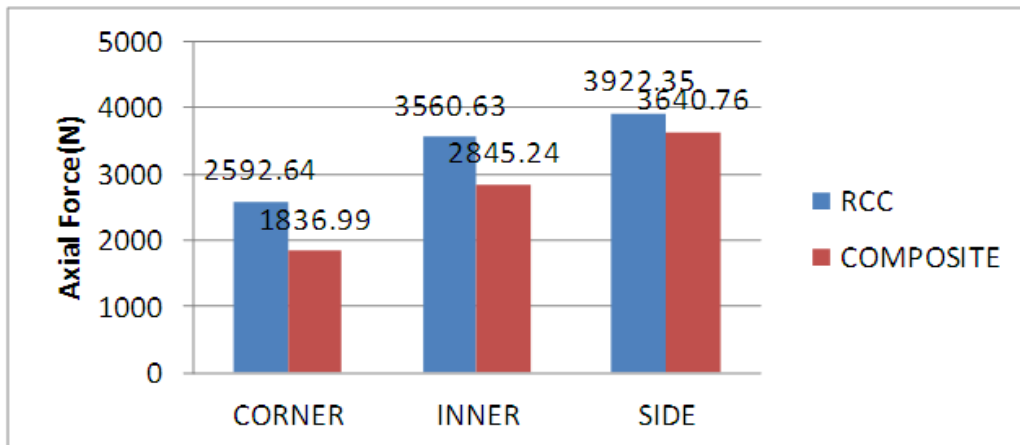


Table -5 Variation of beam moments

Beam moments (KN-m)		
G+12		
Moment	R.C.C.	Composite
Support	394.40	209.229
centre	205.384	119.206

Fig -5 Graph for beam moments (G+12)

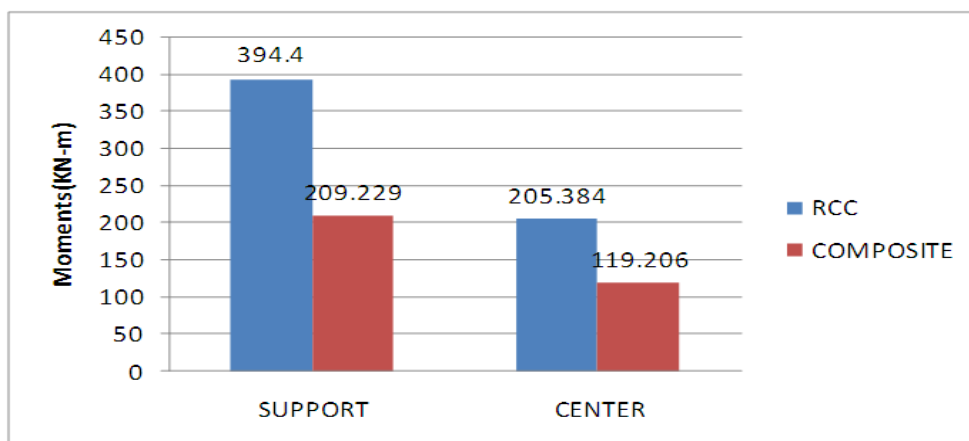
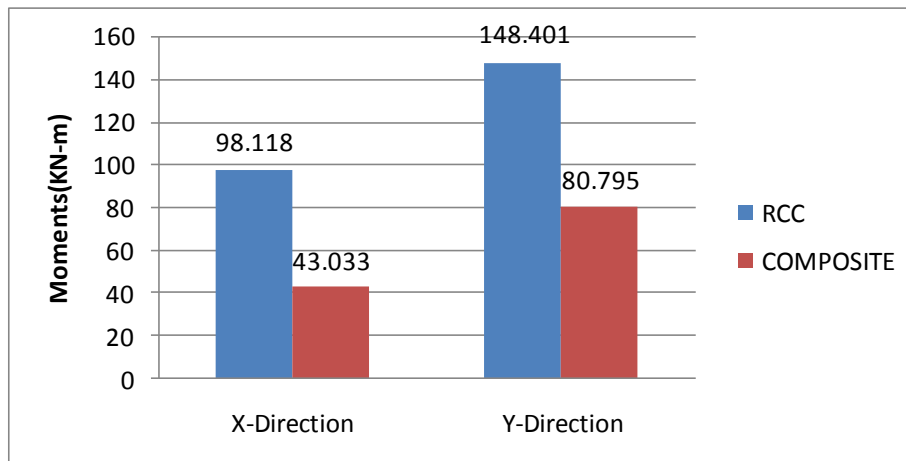


Table -6 Variations of column moments

Column Moments(KN-m)		
G+12		
Moments	R.C.C.	Composite
X-Direction	98.118	43.033
Y-Direction	148.401	80.795

Fig -7 Graph for column moments (G+12)



III.CONCLUSION

- Base shear for composite structure has reduced by 26.60% to 41.16% compared to that of Reinforced concrete structure.
- Displacement for composite structure has increased by 10.28% to 35.63% compared to that of Reinforced concrete structure.
- Drift of all structures is within permissible limit.
- Column forces in composite structure have reduced by 17.23% to 30.24% compare to that of R.C. structure
- Beam moments in composite structures have reduced considerably compared to that of structures.
- As column forces have reduced sizes of footings also reduces compared to that of R.C structure.
- Composite structures are more sparing contrasted with that of R.C structures.
- Likewise time required for development of composite structures is less contrasted with that of R.C structures as no formwork is required.

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