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Comparative Study of Estimate Between Conventional Building and Green Building

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ABSTRACT

Multi-storey R.C.C. residential buildings require large amount energy during construction and its life time compared to green buildings. In present we have done Estimate and cost comparison betweenG+1 R.C.C. Conventional Building and Green Building by using central line method of estimate. Our quantities of material in this estimate are same for bothG+1 Conventional Building and Green Building only the cost has been changed because of different material use in both cases. Finally we have concluded that the green building is economical as well as ecofriendly.

Keywords: Plan of G+1 building, Estimate, central line method, cost comparison.

I. INTRODUCTION

Now a day's various innovative construction materials are being used in construction industry. The use of such eco-friendly material in construction will ultimately result in achieving the goal of construction of "GREEN BUILDING" This project is aimed to make comparative study of practice of Reinforced cement concrete framed structure with traditional material and using other new eco-friendly material. The effort of this project is to make economic analysis also so that one can assess the cost benefit ratio of each construction technique.One of the most important duty of the engineer or an architect is to prepare or forecast the probable cost of the proposed building. The problem of preparing estimates has become somewhat complex because of various factors at the same time, it has been simplified by modern techniques. At the same time, the engineer can store the necessary information in his well-equipped computer section and make the process of estimating not only simple but speedy also. The quantity aspect is governed by the study and analysis of drawings which are prepared with respect to the design of the project. The quality aspects are governed through specifications for materials and workmanship. Thus the quantity aspect decides the quantum of work involved in the construction and it helps in finding out the quantities of various materials required as well as the total labour force necessary for the construction work. An estimate of the project is therefore a forecast of its probable cost. The process of preparing an estimate is known as estimating.

1.1 Conventional Building: Conventional Building implies the use of masonry for the outside walls, where 'masonry' infers the use of bricks and concrete blocks. Conventional building system is defined as a system using in-situ concreting with temporary wooden formwork. Andres and Smith (1998) defined that conventional building system is based on its principle, which the components of the building are fabricated on site through the processes of timber or plywood formwork installation, steel reinforcement, and cast in-situ. In the conventional construction method (reinforced concrete frames and brick as infill), beam, column, wall, and roof are cast in

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situ using timber formworks while steel reinforcement is fabricated on site. This method of construction is labour intensive and involves three separate trades, namely, steel bending, formwork fabrication, and concreting. Skilled carpenters, plasterers, and brick workers are also involved in this method. For big scale project the concrete making are not suitable at the site of construction that time new trends are use that is the RMC means Ready Mix Concrete for reduce the time of construction.

1.2 Green Building: A green building is one which uses less water optimise energy efficacy, conserve natural resources, generates less waste and provide healthier space for occupants, as compare to conventional building. Green building (also known as green construction or sustainable building) refers to a structure and using process that is environmentally responsible and resources efficient throughout a building's life-cycle: from sitting to design, construction, operation, maintenance, renovation and demolition. Buildings that are designed and constructed to minimize environmental impact are often referred to as "sustainable buildings", "green buildings", "low-energy", "energy-efficient" or "high-performance", "passive house " and "(nearly) zero energy buildings". Sometimes it is safe to use them as synonyms, but sometimes similarities are vague. This section aims to review definitions proposed in that report and attempts to capture differences and similarities between the above-mentioned notions. Figure shows the parameters of green building. Green buildings can have tremendous benefits, both tangible and intangible. The most tangible Benefits are the reduction in water and energy consumption right from day one of occupancy. The energy savings could range from 20 - 30 % and water savings around 30 - 50%.

II. DETAIL OF G+1 R.C.C STRUCTURE:

A plan is proposed for estimate a G+1 storied R.C.C. framed residential building on a plot admeasuring 241.12 sq. m. the plot is fronting of on 7.0 m wide road. The key plan of the plot is enclosed is as shown in drawing. After leaving side margins as per general development control regulation the footprint of the building will be of the size of 8.19m. X 12.78m. But it is proposed to put offset to the building so that one car parking can be easily accommodated.

Table No: 1. Specification of G+1 Building.

Type of structure	G + 1 R.C.C. framed structure
General floor to floor height	3.1 m. (3100 mm)
No. of storied	G + 1
Plot Area	236.33sq. m.
Built-up area	198.94 sq. m.
Carpet area	92.00 sq. m.
Soil bearing capacity	300 KN/m^3
Flooring	Mosaic tiles flooring
Thickness of wall	0.23 m
Thickness of slab	0.15 m
Plinth height	0.6 m

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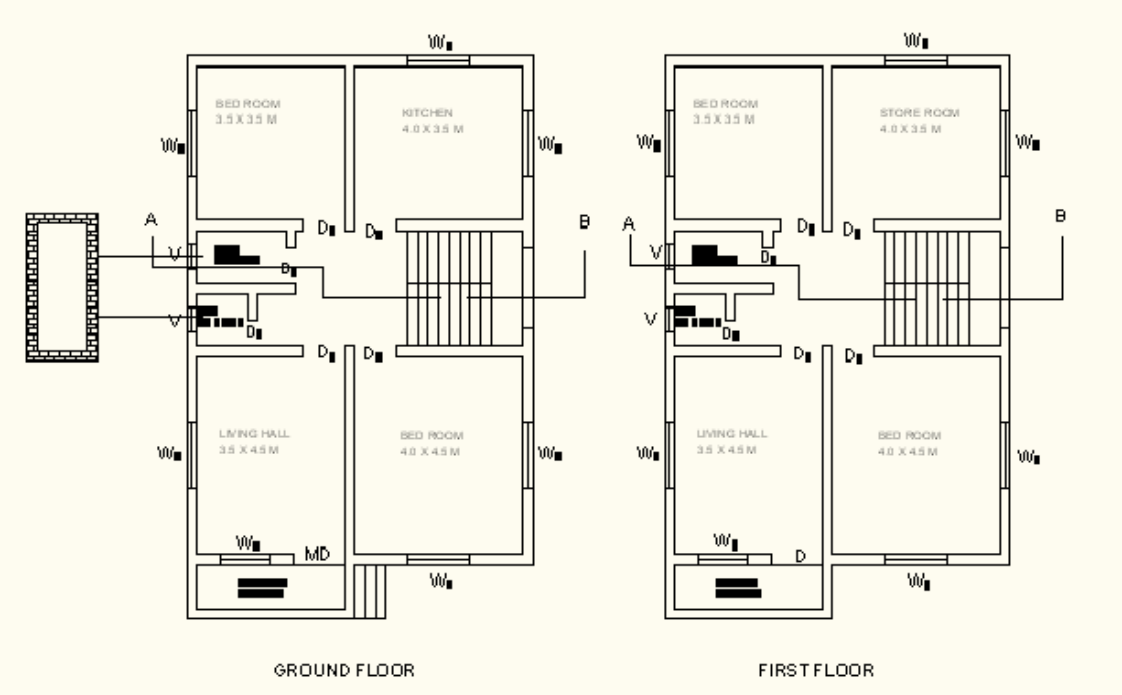

Figure No: 1. Plan of G+1 Conventional and Green building.

III. METHODOLOGY

In present we have done Estimate and cost comparison between G+1 R.C.C. Conventional Building and Green Building by using central line method of estimate. Our quantities of material in this estimate are same for both G+1 Conventional Building and Green Building only the cost has been changed because of different material use in both cases.

VI. RESULT AND DISCUSSION:

A proposed plan for estimate a G+1 storied R.C.C. framed residential building on a plot 241.12 sq. m. the plot is fronting of on 7.0 m wide road. We have done Estimate and cost comparison between G+1 R.C.C. Conventional Building and Green Building by using central line method of estimate and the results as Shown in Table No: 2.

Table No: 2. Materials and Cost of G+1 Building.

Sr.No.	Name of Item	Quantity	Conventional building	Green building
			Cost	Cost
1.	Earth work (cu. m.)	31.56	4419.52	4419.52
2.	Concrete (cu. m.)	83.08	361393.60	321416.55
3.	Brickwork (cu. m.)	92.58	517990.65	383468.21
4.	Plinth filling (cu. m.)	44.89	63212.75	4512.34
5.	Internal plastering (sq. m.)	443.60	88206.96	89751.61
6.	Tile flooring (sq. m.)	139.04	15433.44	10845.12

IJARSE
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7.	Dado (sq. m.)	68.40	22093.20	22093.20
8.	Skirting (m.)	113.60	3067.20	3067.20
9.	Painting (sq. m.)	898.05	59271.63	71844.40
10.	Wood work for door frame (sq. m.)	6.11	21392	21392
11.	Wood work for door shutter (sq. m.)	24.32	53504	53504
12.	Iron gate (sq. m.)	2.52	2898	2898
Total Cost			**1212882.96**	**989212.16**

Cost of green building is 18.44 % less than conventional building. Total cost of conventional building is 1212882.96 ≈ 1212883 Rs. And total cost of green building is 989212.1666 ≈ 989213 Rs. but in green building solar water heater is necessary to install and in conventional it is not necessary to install. Hence cost of green building is increases.

IV. CONCLUSION

In this project we have done the estimate of conventional building and green building. on that basis we have conclude that the green building is economical as well as eco-friendly. In green building debris (waste material) is used as plinth filling. And in Green building bigger size windows are provided for light ventilation hence it reduces energy waste. In plumbing low water pressure tapes are uses hence green building is reduces wastage of water. Hence green building is more energy efficient than conventional building.

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