



# INTERNATIONAL JOURNAL OF ADVANCE RESEARCH, IDEAS AND INNOVATIONS IN TECHNOLOGY

ISSN: 2454-132X

Impact Factor: 6.078

(Volume 7, Issue 3 - V7I3-1725)

Available online at: <https://www.ijariit.com>

## Costing and Rate Analysis of GFRG And Conventional Structure

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### ABSTRACT

*This research paper is about costing and rate analysis of GFRG structure and conventional structure. Being an engineer is our first priority calling for solutions that work for our customers. Increasingly prices, housing is affordable at current rates technology which is why we needed to explore other types of construction plans to reduce construction costs. This paper an effort made to give an idea of how we can do that reducing construction costs and reducing construction time uses pre-design technology. GFRG construction technology also known as Rapid wall construction technology in India. Glass reinforced with gypsum panels, as they are ready-made gypsum building panels have empty holes. This is Rapid wall employed in residential and commercial buildings-built institutions. GFRG walls can be used as part of the structure such as walls and slabs, without outer columns and beams are required.*

**Keywords:** GFRG, Hollow panels, Cost Comparison, New Construction Technology, Affordable Housing.

### 1. INTRODUCTION

In this new era of construction, a different building system for housing construction come from India. Most of these programs were introduced from the first countries of the world and many were unable to enter the Indian settlement levels. This technology entry was started in the background announcement of a rehabilitation program for stakeholders' areas due to the El Nino situation and the Nazi earthquake. On the other hand, many of these programs worked on countries with earthquake problems and most use external objects. In this India, construction plans had to be built accordingly with a typical earthquake E-030 of the National Building Code. On the other hand, Indian researchers for the past 20 years over the years

developed various solutions for construction programs using locally available materials and most of them were tested and approved and registered with BMTPC. So, we have choosing the most expensive and cheap construction to avoid financial problems.

### 2. OBJECTIVE

The purpose of this study is to focus on ideas from Construction industry by the difference of the two Building methods such as the GFRG wall panel system as well a traditional construction program based on a measure of value and we should also produce a certain building management results. We have to collect the properties and details of the cost of the materials. Comparing the methods, we have taken in cost and time to complete each construction work.

### 3. METHODOLOGY

The estimation work is carried out for both GFRG panel and conventional structure. The quantity sheet and abstract sheet is also prepared for both the structures. The estimation of the building quantities can be carried out by any one of the following three methods

- A. Long wall – short wall method
- B. Centre line method
- C. Crossing method

#### A. Long wall – short wall method

In this, a wall corresponding to the length of the room is considered a long wall while a wall perpendicular to a long wall is called a short wall. To find the length of a longwall or short wall, first calculate the length of the middle row of each wall. Then the length of the long wall, (exit to the outside) can be calculated after adding half the width at each end of the length of its centre line. The short wall length is therefore measured

internally and can be obtained by subtracting the width of half the length of its centre line at each end. The height of the long wall usually decreases from ground work to brick work with a large structure while the short wall rises. This length is multiplied by the width and depth to obtain the maximum.

**B. Centre line method**

This method is suitable for walls of similar cross sections. Here the total width of the center line is multiplied by the width and depth of the object to obtain the total value at a time. When the shortcuts or partitions or porch walls meet the main wall, the length of the centre line is reduced by half the width in each organization. Such meetings or members are carefully studied while calculating the value of the full institutional line. The

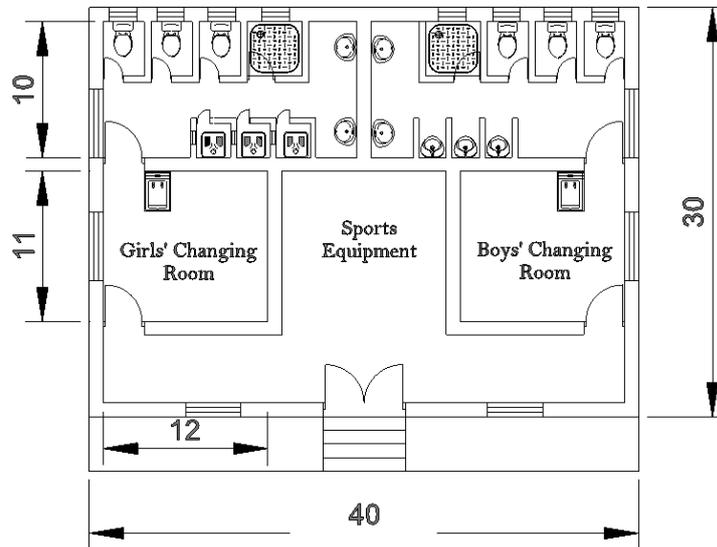
measurements prepared for this method are very accurate and fast.

**C. Crossing method**

This method is acceptable when the outer wall (e.g., surrounding the building) is of the same size and the inner walls are of different sizes. In such cases, the middle line method is used for exterior walls and a long short wall method is used for interior walls. This method is suitable for different walls of different sizes and levels. For this reason, all departments of engineering use this method.

**4. PLAN**

The figure below describes the plan of the proposed method.



**Fig. 1: Plan of sports room**

**5. ESTIMATION OF GFRG BUILDING**

Abstract Sheet of GFRG Building

Sr No.	Item Description	Quantity	Unit	Rate	Amount (Rs)
1	Earthwork in excavation in footing:	54	cu m	75	4050
2	P.C.C in foundation:	2.704	cu m	2500	6760
3	column(300mm×300mm)	4	cu m	7090	28360
4	Plinth Beam	6.97	cu m	3000	20910
5	Earth filling in plinth	47.61	cu m	40	1905
6	Damp proof course (DPC)	22.47	sq m	330	7416
7	GFRG Panel Walls	211.5	sq m	1120	236785
8	GFRG Panel Slab	49.18	cu m	1120	55093
9	Flooring	102.3	sq m	1120	114576
10	Dado	228.08	sq m	1500	342120
11	Skirting	107.22	per m	457	49007
12	Fixing of Doors	32.34	sq m	3192	103230
13	Fixing of Windows	28.08	sq m	3192	89632
				<b>Total cost</b>	<b>1059060</b>
	<b>Recapitulation Sheet:</b>				
	Add 8% Electrification Charges	84725	Rs		
	Add 5% Plumbing Charges	52953	Rs		
	Add 5% Contingencies Charges	52953	Rs		
	Add 2.5% of Work Charges Establishment	26477	Rs		
	<b>Final total cost:</b>	<b>1276168</b>	<b>Rs</b>		

**6. ESTIMATION OF CONVENTIONAL BUILDING**

Abstract Sheet of Conventional Building					
Sr No.	Item Discription	Quantity	Unit	Rate	Amount (Rs)
1	Earthwork in excavation in footing:	54	cu m	75	4050
2	P.C.C in foundation:	2.704	cu m	2500	6760
3	column(300mm×300mm)	4	cu m	7090	28360
4	Plinth Beam	6.97	cu m	3000	20910
5	Earth filling in plinth	47.61	cu m	40	1904.4
6	Damp proof course (DPC)	22.47	sq m	330	7415.1
7	Brick Work in superstructure	5.33853	sq m	3000	16015.59
8	Slab	39.66912	cu m	4000	158676.48
9	Flooring	102.3	sq m	3599	368177.7
10	Dado	228.08	sq m	3599	820859.92
11	Skirting	107.22	per m	457	48999.54
12	Fixing of Doors	32.34	sq m	3192	103229.28
13	Fixing of Windows	28.08	sq m	3192	89631.36
				<b>Total cost</b>	<b>1674989.37</b>
	<b>Recapitulation Sheet:</b>				
	Add 8% Electrification Charges	133999.1496	Rs		
	Add 5% Plumbing Charges	83749.4685	Rs		
	Add 5% Contingencies Charges	83749.4685	Rs		
	Add 2.5% of Work Charges Establishment	41874.73425	Rs		
	<b>Final total cost:</b>	<b>2018362.191</b>	<b>Rs</b>		

**7. CONCLUSION**

The difference between typical costing rate of conventional building and GFRG building is Rs. 398821. GFRG Panels provides a new method of building construction in fast track, fully utilising the benefits of prefabricated, light weight large panels with modular cavities and time tested, conventional cast-in-situ constructional use of concrete and steel reinforcement. By this process, man power, cost and time of construction is reduced. Rapid wall panels have reduced embodied energy and require less energy for thermo-regulation of interiors. Rapid wall buildings thereby reduce burdening of the environment and help to reduce global warming. Rapid wall use also protects the lives and properties of people as these buildings will be resistant to natural disasters like earthquakes, cyclone, fire etc.

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