International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 6 June 2021, pp: 1170-1173 www.ijaem.net ISSN: 2395-5252

Costing and Rate Analysis of GFRG and Conventional Structure

Snehal Salvi, Janhavi Deshpande, Vishal Jadhav, Nandini Pate, Vaishali Kamade, Aniruddha Chavan

[1,2,3,4,5,] *B.Tech student, Dr. Babasaheb Ambedkar Technological University, Lonere*
[6]*Assistant Professor, Department of Civil Engineering, Dr. Babasaheb Ambedkar Technological University, Lonere*
Corresponding Author: Snehal Ashok Salvi

Submitted: 01-06-2021 Revised: 14-06-2021 Accepted: 16-06-2021

ABSTRACT:This research paper is about costing and rate analysis of GFRG structure and conventional structure.Being an engineer is our first prioritycalling for solutions that work for our customers. Increasinglyprices, housing is affordable at current ratestechnology which is why we needed to explore other types ofconstruction plans to reduce construction costs. Thispaper an effort made to give an idea of how we can do thatreducing construction costs and reducing constructiontime uses pre-design technology.GFRG constructiontechnology also known as Rapid wall constructiontechnology in India. Glass reinforced with gypsum panels,as they are ready-made gypsumbuilding panels have empty holes. This is Rapid wallemployed in residential and commercial buildings-builtinstitutions. GFRG walls can be used as part of the structure such as walls and slabs, withoutouter columns and beams are required.

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

I. INTRODUCTION

In this new era of construction, a different buildingsystem for housing construction come from India. Most ofthese programs were introduced from the first countries of the worldand many were unable to enter the Indian settlementlevels. This technology entry was started in the backgroundannouncement 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 mostuse external objects. In this India, construction plans had to be built accordinglywith a typical earthquake E-030 of the National BuildingCode. On the other hand, Indian researchers for the past 20 yearsover the years developed various solutions for construction programsusing locally available materials and most of them weretested and approved and registered with BMTPC. So, we havechoosing the most expensive and cheap construction to avoidfinancial problems.

II. 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 wella traditional construction program based on a measure of value and we should also produce a certain building managementresults.We have to collect the properties and details of the cost of the materials. Comparing the methods, we have taken in cost and timeto complete each construction work.

III. 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 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

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 6 June 2021, pp: 1170-1173 www.ijaem.net ISSN: 2395-5252

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.

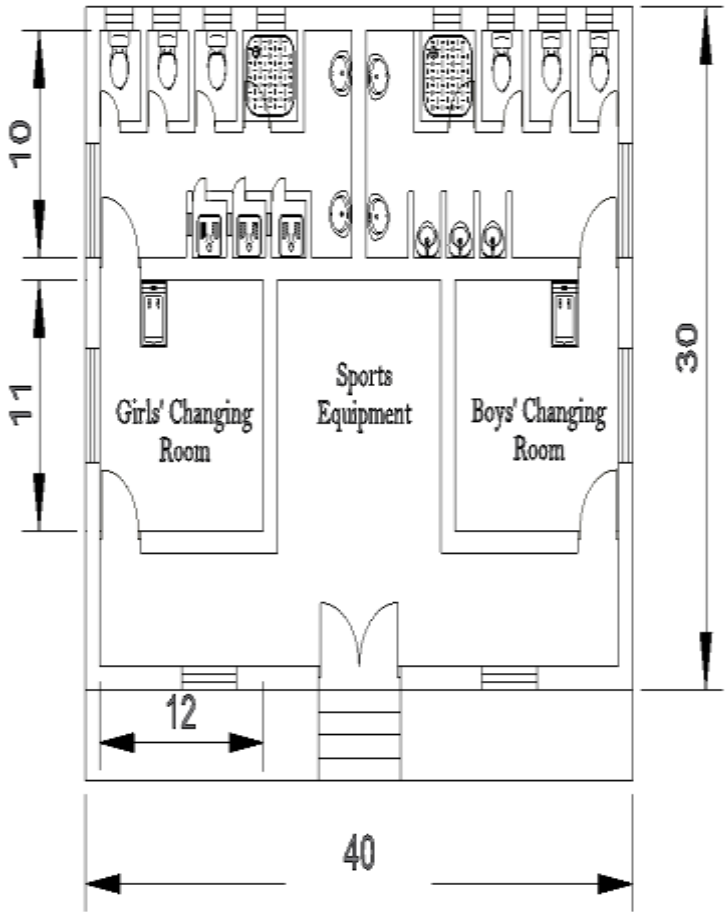
B. Centre line method

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.

IV. PLAN



PLAN OF SPORTS ROOM

V.ESTIMATION OF GFRG BUILDING

Abstract Sheet of GFRG Building

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 6 June 2021, pp: 1170-1173 www.ijaem.net ISSN: 2395-5252

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
				Total cost	**1059060**
	Recapitulation Sheet:				
	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		
	Final total cost:	**1276168**	**Rs**		

VI.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

International Journal of Advances in Engineering and Management (IJAEM)
Volume 3, Issue 6 June 2021, pp: 1170-1173 www.ijaem.net ISSN: 2395-5252

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
				Total cost	**1674989.37**
	Recapitulation Sheet:				
	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		
	Final total cost:	**2018362.191**	**Rs**		

VII. 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. Rapidwall panels have reduced embodied energy and require less energy for thermo-regulation of interiors. Rapidwall buildings thereby reduce burdening of the environment and help to reduce global warming.Rapidwall use also protects the lives and properties of people as these buildings will be resistant to natural disasters like earthquakes, cyclone, fire etc.

REFERENCES

[1]. SubhanAlisha Sk., Akber Sk., SaiMan G. (2016) "Low Cost Housing by Using GFRG Panels" International Journal of Scientific Research in Science, Engineering and Technology.

[2]. Shukla A., Khan M.A.,Kumar A. (2016) "A Review of Research on Building System Using Glass fibre Reinforced Gypsum Wall Panels" International Research Journal of Engineering and Technology (IRJET).

[3]. MeselhyElsaeed M.S. (2016) "Cost Model for using Glass Fibre Reinforced Gypsum System (GFRG)" International Journal of Development and Economic Sustainability.

[4]. Menon D. (2014) "Rapid Affordable Mass Housing using Glass Fibre Reinforced Gypsum (GFRG) Panels "International Journal of Scientific & Engineering.

[5]. Manjummekudiyil E.M., Alias B.P., Eldhose B.K., Rajan S., Hussain T. (2015) "Study of GFRG panel and its Strengthening" International Journal of Civil and Structural Engineering Research.

[6]. Janardhana M, Prasad A.M. and Menon D. (2004) "Studies on the Behavior of Glass Fiber Reinforced Gypsum Wall Panels" Indian Institute of Technology Madras