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Study On Low Cost Housing

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Abstract: *The provision of low cost housing is a continuous struggle for government, as well as for the individuals. Everyone is seeking the 'best' low cost housing solution. In the past very attempts were undertaken to address this issue one can find numerous examples of realized low cost housing projects worldwide.This report is mainly concentrate on chapter construction material a few low cost material and planning are discussed in this report. The report are also includes an important chapter as specification the material for real construction of house are specified for example use of light weight solid blocks and as per planning view design of room size is depend upon size of brick and size of flooring material.*
Keyword- *Low-cost Housing, Materials and Planning*

I. Introduction

Affordable housing is a term used to describe dwelling units whose total housing cost are deemed "Affordable" to a group of people within a specified income range. The construction established by modular planning and use of locally available low cost materials which are reduce the overall cost of the structure. It is necessity to adopt cost effective, innovative and environment-friendly housing technologies for the construction of houses and buildings and availing them at low cost comparatively. It was observed that with if the GFRG panels can be used as an alternative to conventional brick the cost of construction can reduce up to 25%.

II. Low Cost Housing Materials

2.1. Glass Fiber Reinforced Gypsum (GFRG Panel)

Fig.1: GFRG Panels

GFRG panels also called gypcrete panel is an energy efficient green building material with huge potential for use as load bearing and non-load bearing wall panels. It has very high level of resistance to fire, heat, water, termites, rot and corrosion. Panels are presently manufactured to a thickness of 124mm, a length of 12m and height of 3m, under carefully controlled condition. The panel can be cut to required size. The panel contain cavities that may be filled with concrete and reinforced with steel bars to impart additional strength and ductility. Its main application is in the construction of walls floor and roof slab in combination with reinforced concrete.

According to IIT Madras Rapid wall construction, especially in repetitive type mass housing, time for construction will be reduced by 75-80% thereby reducing overall overhead establishment costs with reduced lock up investment period and less labour component. Comparative study of rapid wall building and conventional building (2 storey 1500 sq.ft) shows significant savings in rapid wall buildings.

Table. 1 Comparison Between Rapidwall Building and Conventional Building

Materials/Items	Rapidwall Building	Conventional Building	Saving in %
Cement	16 Tons	32.55 Ton	50.8
Steel	1800 Kg	2779Kg	35.2
River sand	20 cum	83.37 cum	76
Bricks	_	57200	
Water	50000 Ltr	200000 Ltr	75
Labour	389 man-days	1200 man-days	67.59
Construction Time	21 Days	120 Days	82
Construction Cost	Rs. 13.25 Lakhs	Rs. 18.27 Lakhs	27.47

2.2. Fly Ash Brick

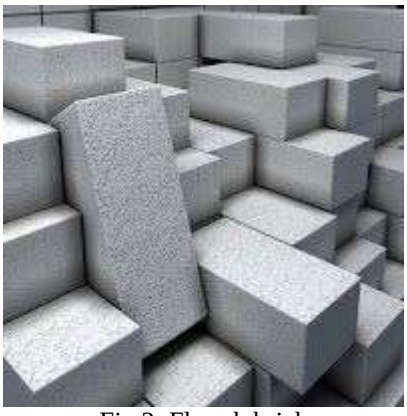

Fig.2: Fly ash brick

In brick masonry structures fly ash bricks are hi-tech well-improved quality bricks used for construction of. As it has better properties than normal clay bricks this bricks are can be replaced by normal clay brick. Fly ash bricks competitive in comparison to the conventional clay bricks and provide enormous indirect benefits. The utilization of fly ash bricks results in conservation of natural resources as well as protection of environment. Following are the advantages of fly ash brick which reduce the overall cost of the structure.

- It reduces dead load on structures due to light weight (2.6 kg, dimension: 230 mm X 110 mm X 70 mm).
- Same number of bricks will cover more area than clay bricks.
- Due to uniform size of bricks mortar required for joints and plaster reduces almost by 50%.
- Due to lower water penetration seepage of water through bricks is considerably reduced.
- It requires less mortar during construction.

2.3. Plastic Bottles

Fig.3: Plastic bottle house

Plastic bottles is produce from of junk produced and water bottle which can be used instead of some construction materials such as brick. It is interesting to be stated that in the research work it is being proof that

the plastic bottles has as same strength as bricks, ceramic block and concrete block but with the difference that the plastic bottle has got lots of advantages too. The house can be constructing by this plastic bottles. It can be used for the walls, joist ceiling and concrete column. This can reduce up to 47% diminution in the final cost. Separation of various components of cost shows that the use of local manpower in making bottle panels can lead to cost reduction up to 73% compared to building the walls using the brick and concrete block. It was noted that the sophisticated manpower can lead to reducing the construction time and the relative costs also become lower.

Table 2. Comparison between the walls by bottles panel, ceramic block and concrete block.

Factors	Considerations	Bottle Panel	Ceramic Block	Concrete Block
Time and speed of execution	5 persons team-one working day	15% faster	120 m2	Less than 100 m
Execution cost	Using calculations of panel	Less manpower and indigenous	More human resources- the higher cost	More human resources- the higher cost
Material waste		No wastage	High and unusable	High and unusable

2.4. Bamboo

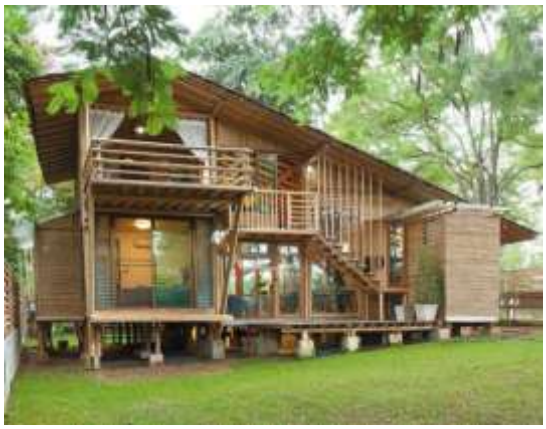

Fig.4: Bamboo house

Generally bamboo is utilized as a building material for scaffolding, bridges and houses. Bamboo is a natural composite material with a high strength-to-weight ratio useful for structures. It has a higher compressive strength than wood, brick or concrete and a tensile strength that rivals steel.

Where bamboo is plentiful it has been used as reinforcement for concrete in those areas, though dispute exists over its effectiveness in the various studies done on the subject. Bamboo does have the necessary strength to fulfill the structural function, but untreated bamboo will swell with water absorbed from the concrete, causing it to crack. Several procedures must be followed to overcome this shortcoming.

III. Modular Planning

Standardization and dimensional co-ordination have been recognized to efficiency and economic construction for low cost housing. It must be necessary to plan the house on modular basis so that the dimension of structure will confirm to the standard dimensions of modular product without cutting and patching at site. The convenient module which is increasingly being used in this country for concrete hollow blocks and other building units in 4 inch. So, if size of the all the rooms and the height of flours are made multiple of 4 inch there would be no need oh having to cut and patch blocks which would mean an appreciable saving in cost of material and labors. In modular construction it is required to make openings for doors and windows can firming to the principles.

3.1. Shape of Housing

The shape of house as an important bearing on its cost of the construction due to the amount of outside wall and roof area required to in close given amount of space. The square is most economical shape since it provides the maximum amount of floor area with the list amount of wall area. Corner construction cost is more than standard wall construction due to extra expenditure in corner and increasing the length of wall with conclusion that the square and rectangular shaped plans are most costly shapes. Economy in construction can also be affected by building small 1&2 room house is rows on account of saving in more numbers of wallpaper from saving the construction cost the low houses are characterized by economy in land use.

3.2. Rome Size

A definite saving cab is made in cost of constructing house by reducing the size of room. By considering position of furniture , location of doors, the windows, size of room can be reduced without effect of the committee of experts for building work in their recent report has stated that minimal size of living room should be 120 sq. feet

According to Gonzalo Lizarralde "The 37 m2 basic house (the core unit) offered to residents includes a piece of land of 4 by10 mts. The layout includes a kitchen, a living area, two bedrooms and one bathroom distributed in two levels. The guide explained in detail the main characteristics of the house, the construction methods, the technical information about pipelines and installations, the structural requirements for changes and additions and the conditions for guaranties. According to the guide, only pre-established modifications and additions can secure that the contractor will grant the construction guaranties in case of imperfections."

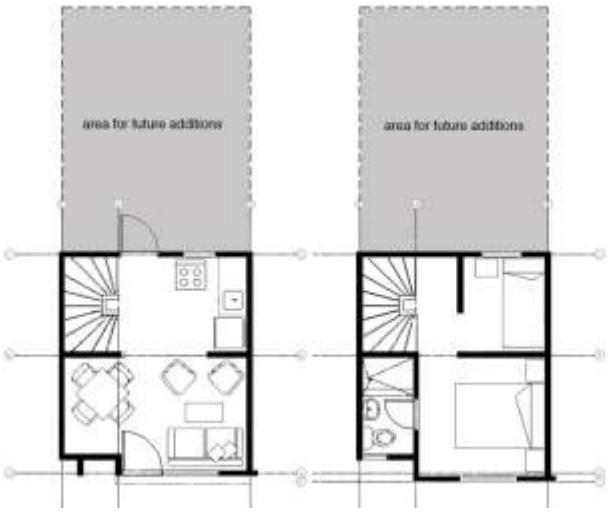

Fig.5: Plans of first level (left) and second level (right).

IV. Conclusion

Low cost housing targets can be achieved by replacing the conventional methods of planning and construction materials which are mention in this paper and other locally available materials. Also engineers can use their own efficiency and innovative ideas to reduce cost of construction. A middle class family can construct their own house in low cost and pleasant manner.

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