

LOW COST HOUSING

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Abstract - Low Cost Housing is a new concept which deals with effective budgeting and following of techniques which help in reducing the cost construction through the use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure. In today's life housing is a basic need of human being. But this is out of the means of low income householder who constitute majority of the population in the country. Moreover, the government of India has a vision "Housing for all by the year 2010". Low cost housing becomes most important topic in civil engineering. In this report some methods of low cost housing is given. This report is mainly concentrated on chapter construction materials. A few low cost materials are developed and discussed in this report. This report also includes an important chapter as specification. The material needs for real construction of house are specified. As our project site, we referred the 'GREEN EXOTICA' located at the Bakrol vadatal road. Today, there is no awareness in the people as well as engineers & contractors about this of low cost housing. So, we can hope that this project could be a suggestion for any construction authority or the local contractors. so, that in the time of high land cost as well as costly construction period, a common man can have such this kind of property.

Key Words: low cost housing, alternative construction methods, cost effective materials, construction techniques

1. INTRODUCTION

Low cost housing is a new concept which deals with effective budgeting and following of techniques which help in reducing the cost construction through the use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure. India is the one of the largest country in the world and possessing one of the largest population in the world. India has still lots of areas where it is behind in comparison with top most economy in world. To stay healthy one need a proper place to reside for the entire life and that is home. This is one of the important components of one's life. As we know the India has population about 1.4 billion and increasing at unbelievable rates. In developing countries such as in India, only 20% of populations are high-income earners.

Low cost housing doesn't mean that the building materials are cheap. It means a concept of reduction in cost of construction without sacrificing the strength required for the strength required for the performance of building. Apart from financial measure the actual cost of housing can also be reduced by sharing the walls or smart design. Reducing cost of structure is also achieved by postponing finishing work. In low cost housing construction method of walling, roofing and lintel are compared. It is significant that against the annual population growth rate of 2% in the country, the number of residential building has increased at an annual rate of only 1.5%. According to the federation of Indian chambers of commerce and industry (FICCI), Keeping in view the existing housing crisis in the country, the present addition of 2.5 million units a year is hopelessly inadequate. Some 110 million housing units are required to be constructed annually for meeting the housing requirements of the country. the gravity of the housing situation in India urban as well as rural sector is discussed at length in the following pages.

1.1 HOUSING SHORTAGE

There are a few individual estimations of housing shortages that suggest shortages are much more than that of the government estimates. For instance, using the 2011 Census and NSS housing rounds (2008-09), It suggests that there is a housing shortage of more than 62 million units in rural India. In another exercise, the shortages have been calculated to the tune of 140 million. Notwithstanding the plausible methodology that these estimates use, even if we consider the a fact that rural India has an enormous conservative estimates of Working Group, it remains housing shortage of more than 43 million. Only a small number of the houses in rural India are pakka (built area of partly pakka house) and partly kachcha. For details please refer to Appendix a Kachcha houses need constant repairs and their roofs specially are villager both financially otherwise. The size of the houses is generally as the number of rooms per house is low and the rooms are small. According to the 1971 census at least 50 per cent of the households etc. do not have anything more than one bare room some of their having not number of persons per habitable room at 53 is very high. The qualitative aspects of the problem are all the more depressions.

1.2 Necessity of Low cost Housing

Decent, affordable housing is important to families. Certainly, it fulfills a basic human need for shelter, but it also contributes to the well being of both parents and children. Studies show that children in stable housing do better in school are less likely to experience distraction in their education due to unwanted moves. Decent, affordable housing reduces stress, toxins, and infectious disease, which leads to improvement in both physical and mental health. Affordable housing also frees up funds within families tight budgets to spend on health care and food. For parents, living in decent, affordable housing also means reduced stress due to a lessening of concerns that high housing costs will lead to foreclosure and eviction this in turn leads to fewer physical and mental health problems and reduced the job.

1.3 Benefits of Low cost housing

1) Research has shown that affordable housing reduces the cost burden of renting an apartment and provides households with the opportunity to invest more money and time in their children’s educational development. 2) Affordable housing allows households to invest their limited income in healthcare and quality food. Additionally, it can increase the likelihood that children are not exposed to environmental hazards. For example, studies have concluded that low-income children living in HUD-assisted homes have less exposure to lead than those who were unassisted. 3) Research has found that the current lack of affordable housing prevents low- income families from accessing economic opportunities, which costs our economy almost \$2 trillion in wages and GDP growth.

2. ANALYSIS

2.1 PLANNING

Reducing the depth & width up to safe extend of footing can reduce over-all cost of construction as it reduces the quantity of excavation, concrete and masonry work for foundation.

2.2 Selection of material for low cost housing

Table: 1 Material

Component	Materials according to original plan	Materials according to revised plan
Basic building unit	First class conventional brick	Pre-cast waffle wall
Base of foundation	P.C.C	B.B.C.C
Mortar material	Ordinary Portland cement	Pozzolonna cement

Concrete work ratio	1:2:4	0.6+0.4:2:4
Plaster	Four layer of plaster 1:4	-
Exterior	Decorative tile(elevation), weather proof acrylic paint (side)	Distemper with weather cost
Interior	Royale emulsion	Distemper
Flooring material	Vitrified tile each 2*2 ft.	IPS Flooring
Flooring material (bathroom)	Mozzatera	Glazed ceramic
Lintel	Concrete lintel	Pre cast lintel
Door frame	Wooden frame	Pre-cast concrete frame
Shutter	Partially glazed shutter (windows) fully-wooden panel shutter (Door)	Aluminum glazed shutter with slider
Sanitary pipe	GI pipe	PVC pipes
Balcony/INTERRIOR Stair case railing	Stainless steel	Mild steel with black paint
Window grill	Mild steel	Mild steel
Exterior stair case	R.C.C	Fabricated M.S
Kitchen	Granite platform kitchen with large sink	Green marble

2.3 ENVIRONMENT FRIENDLY MATERIAL USED FOR LOW COST HOUSING

- Waffle slab/wall
- Lime sand brick
- Cement-waste slag brick
- Concrete hollow block
- Light weight concrete(3E) block panel
- Foam concrete panel
- Hooking panel
- Straw panel
- Hollow gypsum board & blocks
- AAC block (autoclaved aerated concrete)
- Paint for Interior & Exterior Wall

2.4 WAFFLE SLAB /WAFFLE WALL

The Waffle slab system can be called as a two – way joist slab system which comprises of ribs constructed in perpendicular direction. Waffle slabs are most suitable for construction of slabs with long span. Slabs that have span greater than 16m can make use of a waffle slab design.



FIG -1: Waffle Slab /Waffle Wall

2.5 Precast Flat Panel System

Floor and wall units are produced off-site in a factory and erected on-site to form robust structures, ideal for all repetitive cellular projects. Panels can include services, windows, doors and finishes. Building envelope panels with factory fitted insulation and decorative cladding can also be used as load-bearing elements. This offers factory quality and accuracy, together with speed of erection on-site. This type of construction is normally called cross wall construction and advice on the design can be found in The Concrete Centre's publication Cross wall Construction. More detailed structural advice can be found in The Concrete Centre's publication Residential Cellular Concrete Buildings.



FIG-2: Flat panel

2.6 Benefits & Drawbacks of Waffle Slab

2.6.1 Benefits of Waffle Slab

1) Waffle slabs are used for larger span slabs or floors and used when there is limited requirement for number of columns. 2) The load carrying capacity of waffle slab is greater than the other types of slabs.3) They provide good structural stability along with aesthetic appearance. Hence, it is constructed for airports, hospitals, temples, churches etc.4) The waffle slab can be made of concrete or wood or steel among those concrete waffle slab is preferred for commercial buildings and other two are preferred for garages, decorative halls etc. 5) It has good vibration control

capacity because of two directional reinforcement. So, it is useful for public buildings to control vibrations created by movements of crowd. 6) Waffle slabs are lightweight and require less amount of concrete, hence it is economical. 7) Construction of waffle slab is easy and quick with good supervision. 8) Concrete and steel volume required is small, hence, light framework is enough for waffle slab. 9) Several services like lighting, plumbing pipes, electrical wiring, air conditioning, insulation materials etc. can be provided within the depth of waffle slab by providing holes in the waffle bottom surface. This system is called as Hole deck.

2.6.2 Drawbacks of Waffle Slab

Formwork tools required are very costly because of large quantity requirement of pods and some special tools.2) The floor height should be more hence number of floors is reduced. 3)The services provided in the waffle arrangement without proper maintenance may cause damages to the slab. 4) Skilled workers are required during its construction. 5) They are not suitable for sloped areas. If there is slope area, the area must be leveled with filling or by excavating. For soil filling, good soil should be used. 6) They are not suitable against high winds or cyclonic areas because of their light weight.

3.0 CONCLUSIONS

- ❖ Price of property could be held down by 30 to 35 percent of total cost by accounting proper measures involving.
- ❖ Proper cost-effective planning.
- ❖ Selection of alternative cost-effective materials.
- ❖ Locally available materials are preferable to eliminate cost of transportation.
- ❖ Selection of alternative cost-effective methods of construction.
- ❖ Proper scheduling of work, labour and materials.
- ❖ Encouraging industries manufacturing and use of alternative material also Create employment opportunities.

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