

A Research on Proposed Low-Cost House Under Government Scheme Aawas Yojana

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Abstract: In this project we are proposing estimate to people a affordable house in low cost & same strength. Under PM Aawas Yojana for who are beneficiably for this Scheme. Provide Categories to need of the people low income several residential project. To reduce the cost of housing materials with the help of new technical & smart alternative material which to identify the advance materials and construction technique. which can be reduce the cost of construction. gives the same strength as regular materials gives and its costing will be less than as compared to the regular material used in construction. We are not compromising with the strength to provide affordable housing is a term used to describe to reduce the cost of construction and at the same time not sacrifice any element of safety or serviceability of the house over the life cycle.

INTRODUCTION

This paper is low cost housing of various techniques are available in the low cost housing. Our Moto is to reduce the cost of Construction cost of wall, cost of plaster, cost of labour & mason. This paper is apply for rural area and poor family in Indian government scheme PM Aawas Yojana in which they provide 3 lakh for one poor family. This amount is not sufficient for the Constructions of one BHK house so in Searching of new techniques and smart material for construction. The concept of low cost housing is successful because it is Eco- friendly Technology and low cost resources for construction. In this study modern technology used for development of Villages in India which consists of strength of materials cost and efficiency. In low cost housing uses low cost material and techniques which reduces overall cost of construction.

It is very important to have a shelter of your own. The housing market has undergone constant change over the years. And it has changed for the better. There is

innumerable housing projects coming up in different countries of the but are they catering to the needs of the people with low income.

several residential projects are undoubtedly coming up but there are very few which help. Need of the hour is low cost homes. Construction of low-cost housing by using the low-cost building materials increases the access to buildings by low income group peoples. Low cost housing can be achieved by use of efficient planning and project management, low cost mater.

housing sector caters to the basic needs of the society and provides shelter. real estate sector is a major part of the indian economy and contributed to about 6.3% of gdp during 2013-14 (credai, 2013). the government of india has launched many schemes to bridge the gap of demand and supply of housing in the low-income group (lig) and economically weaker section (ews) group. The recent initiative is the Pradhan mantri Aawas Yojana (PMAY) By The Ministry Of Housing And Urban Affairs. It was Launched In June 2015 With The Vision Of Meeting The Demand Of Nearly 20 Million House Units By 2022.

Low Cost Housing Materials Can Be Broadly Classified Into Natural Materials And Manmade Materials According To The Source Of The Building Material.

LITERATURE REVIEW

Nahro Radi Husein et al., [2013] Investigated the strength capability of lightweight web sandwich panel (LWSP) in terms of first crack load, load- deflection curve for flexural load with (one point loading and third point loading), module of rupture, ultimate flexural load, axial load- deformation curve and the failure mode. The unit weight of the LWSP's which have aerated concrete as a core is (1850-1950) Kg/m³ and the unit weight of the LWSP's which have

thermocol as a core (1250-1300) Kg/m³]. Piyush Bhandari, Evaluating properties of lightweight sandwich wall panels in 2016, Department of Civil engineering, P.D.V.V.P College of Engineering, Ahmednagar.

Abhijit Mandlik- Expanded polystyrene (EPS) in 2013, Experimental investigation of engineering properties such as compressive strength, modulus of elasticity, drying shrinkage and creep, of expanded polystyrene (EPS) aggregate concrete varying in density. Cost of EPS is less compared to that of normal concrete. Increase in the EPS beads content in concrete mixes reduces the compressive and tensile strength of concrete. All the EPS concrete without any special bonding agent show good workability and could easily be compacted and finished.

Ahimbisibwe, A. Ndibwami, etal. [2]: In this paper they studied that for construction of affordable house they utilize the commonly used materials which are locally available, by adopting some building techniques and proper management in the construction of low cost housing. They highlighted a need to introduce alternative construction methods for the rural residents and the local artisans to achieve more applicable results in rural housing.

Mr. Raj, Ms. Panimalar [1]: In low cost housing construction various technologies have been studied such as Prefabrication, Economical Walling System by using Rat Trap Bond and Filler Slab Technology. The rat trap bond masonry requires approximately 25% less bricks and 40% less mortar bag traditional masonry as compare to c building. And the filler slab consume less concrete and steel due to reduce weight of slab by the introduction of a less heavy, low cost filler materials by replacing the conventional method the product is effective and economical.

S. Borkar, A. Limje, etal [3]: In their research they replace walls of conventional building by using GFRG (Glass Fiber Reinforce Gypsum) panel. The reason behind this is to overcome the unviability of natural resources like sand, gravel, etc. By using this technology is having possibility to provide low cost house to homeless citizen. The GFRG panel is economic

and save up to 30% of construction cost and the construction of rapid wall saves 67% in time of construction as compare with conventional building.

1.1 Low Cost Construction Technique

It should be noted that cost-effective construction technologies do not compromise with safety and security of the buildings. The detail procedures of each step used for the case study are. The filler slab requires less concrete and steel due to reduce weight of slab by using of less heavy and low-cost filler material. The use of natural materials like Thermocol wall, Steel Mesh (2mm), bubble Tech concrete, Bamboo Doors & Waste tile etc. is a centuries old practice in India. These materials apart from being locally available have easy workability and speedy construction hence reducing costs. Also industrial wastes like fly ash blocks properties which can act as excellent substitute material. This paper aims to bring together the studies of these materials keeping in mind.

1.1.1 List of Construction Material

- Cement.
- Fine Aggregate
- Water
- Steel Mesh.
- AAC Blocks
- Waste Tile

Smart materials

Materials Which Are Worldwide Used And Has Been Considered That. From This Alternative Materials We Can Reduce The Time Of Construction. And Also Useful To Cut The Cost Of Project.

- Thermocol Walls.
- Fly Ash Bricks.
- Bubble Deck Concrete.

Thermocol Wall

Thermocol Insulation Can Be Defined As The Process Which Aids The In The Reduction Of The Transfer Of Heat From Outside To Inside. Thermal Insulation Enables Consistency In Room Temp By Keeping The Room Cooler In Summer And Warmer In Winter From The Outside .It Is Energy Saving As The Transfer Of Heat From Inside To Outside. Thermocol Sheets For Wall Insulation Are Available At Different Sizes And Density Installation Of Thermocol Sheets. Are Depend On Different Factors Which Include

Wind Velocity, Temp, Differential Environment Conditions And The Size Of The Building. These Thermocol Products From Our End Have Been Vastly Used For Many Years In Residential, Agriculture,

Industrial Buildings And Warehouse. Thermocol Sheets Are In Fact An Excellent Thermal Insulator For The Indian Climate.



Fig.5.1 Thermocol Wall

Features

- Eco-Friendly.
- Easy To Mold.
- Precise Dimensions.
- Good Chemical Resistance.
- Durable Quality.
- High Resistant To Water & Heat
- Recyclable Material.
- Long Lasting.

Fly Ash Bricks.

Fly Ash Brick (FAB) Is A Building Material, Specifically Masonry Units, Containing Class C Or

Class F Fly Ash And Water. Compre Ssed Cet 28 Mp A (272 At M) And Cured For 24 Hours In A 66°C Steam Bath, Then Toughned With An Air Entrainment Agent, The Bricks Can Last For More Than 100 Freeze Thaw Cycles. Lowing To The High Concentration Of Calcium Oxide In Class Cfly Ash, The Brick Is Described As "Self- Cementing." The Manufacturing Method Saves Energy, Reduces Mercury Pollution In The Environment And Often Costs 20% Less Than Traditional Clay Brick Manufacturing.



Fig.5.2 Fly Ash Bricks

Advantages

If Reduced Dead Load On Structure Due To Light Weight (2.6kg Dimension:- 230mm X 110mm X 70mm)

Same Number Of Bricks Will Cover More Area Than Clay Bricks.

High Fire Insulation.

Due To Uniform Size Of Bricks Mortar Required For Joints And Plaster Reduces Almost By 50%.

These Bricks Do Not Require Soaking In Water For 24 Hours. Sprinkling Of Water Before Use Is Enough

Bubble Deck Concrete Slab.

Bubble Deck Is A Revolutionary Method Of Virtually Eliminating Concrete From The Floor Slab Not Performing Any Structural Function. Thereby

Dramatically Reducing Structural Dead Weight. Bubble Deck Is Based On A New Patented Technique - The Direct Way Of Linking Air And Steel. Void Formers In The Middle Of A Flat Slab Eliminates 35% Of Slabs Self Weight Removing Constraints Of High Dead Loads And Short Spans. Bubble Deck Slab Has A Superiority Over The Conventional Slab As It Has Reduced Weight Increased Strength Fewer Columns And No Beams Or Ribs Under The Ceiling. The Bubble Deck Slab Is Fire Proof And The Safety Against Earthquake Is Significantly Benefited. Fireproof Construction Alone From The Weight Reduction. The Major Saving Are Found In Materials (Slabs , Pillers,Fundaments) Upto 50%. Due To Its Lightweight. Transportation Costs Are Heavily Reduced.



Fig. 5.3 Bubble Deck Concrete Slab.

Difference Between Bubble Deck Slab & Normal Slabs.

The Invention Of Bubble Deck Slab Will Dramatically Reduce Structural Dead Weight By Linking Air & Steel. Reinforcement Directly. It Has Many Advantage T As Compared To Traditional Concrete. Slab Such As Lower Total Cost, Reduced Material Use, Enhanced Structural Efficiency, Decreased Construction Time, And Is A Green.

Advantages Of Bubble Deck Slab.

Superior Statics.

Production And Carrying Out.

Transportation.

Economic Savings.

Environmental Improvement.

Explosions Safe

Functional Applicability

Residential Living, Offices, Utility And Industrial Buildings. Used In Offices Apartments, Villas, Hotels Schools, Parking, Hospitals, Laboratories And Factories.

3.3 Cost effectiveness.

The construction method is selected as the standards normally used in construction. Apart from that we used the thermocol sheets for construction of walls from which we will reduced the direct cost of mortar, plastering & bricks cost. Hence we are also using the bamboo & plywood doors with normal wooden frame which are very cost cutting. This method is very time

saving so that labour & mason cost will be reduced. However, it is necessary that good planning and design methods shall be adopted by utilizing the services of an experienced engineer or an architect for supervising the work, thereby achieving overall cost effectiveness.

1.4 Cost Comparison

Sr.no	Material/description	Total quantity	Cost per unit	Total cost
1.	Site cleaning	54 sq.m	As per location	7000 /-
2.	Total qty. of excavation	72 m3	Rs. 200/m3	14400 /-
3.	Total qty. of filling	3 m3	Rs. 500/m3	1500 /-
4.	Total qty. of shuttering	80.71 sq.m	RS. 250/sq.m	21000 /-
5.	Total qty. of bricks	12810 nos.	Rs. 7/PC	89670 /-
6.	No. of cement bags	110 bags	Rs. 350/Bag	38500 /-
7.	Total volume of sand	23.2 m3	Rs. 4000/m3	92800 /-
8.	Total volume of aggregate	14 m3	RS. 1200/m3	16800 /-
9.	Total qty. of steel	660 KG	Rs. 75/KG	49500 /-
10.	Total qty. of binding wire	10.5 KG	Rs. 70/KG	735 /-
11.	Labour cost	54 sq.m	Rs. 3700/sq.m	200000/-
Total cost				531905 /-

Rate analysis of proposed plan

Sr.no	Material/description	Total quantity	Cost per unit	Total cost
1.	Site cleaning	54 sq.m	As per location	7000 /-
2.	Total qty. of excavation	72 m3	Rs. 200/m3	14400 /-
3.	Total qty. of filling	3 m3	Rs. 500/m3	1500 /-
4.	Total qty. of shuttering	80.71 sq.m	RS. 250/sq.m	21000 /-
5.	Total qty. of AAC blocks	750 nos.	Rs. 70/PC	52500 /-
6.	Total qty. of panels	15 nos.	Rs. 472/pc	7080 /-
7.	No. of cement bags	80 bags	Rs. 350/Bag	28000 /-
8.	Total volume of sand	11 m3	Rs. 4000/m3	44000 /-
9.	Total volume of aggregate	14 m3	RS. 1200/m3	16800 /-
10.	Total qty. of steel	660 KG	Rs. 75/KG	49500 /-
11.	Total qty. of binding wire	10.5 KG	Rs. 70/KG	735 /-
12.	Labour cost	54 sq.m	Rs. 3000/sq.m	162000/-
Total cost				404515 /-

Low cost rate analysis.

We had carried out the cost comparison rate analysis of traditional method & low cost method with help of Thermocol panels and AAC Blocks. In which we are able to cut the cost of construction for at least 25% with respect to the traditional method.

CONCLUSION

The dream of owning a house is still a dream of many poor people. Many researches have suggested to

replace the major part of conventional material with a new low cost housing material and each material has its own advantages and disadvantages. Our moto is to provide them a good quality house with a affordable cost. This paper examines the cost comparison between the traditional method and lowcost housing with smart materials method. Many case study has been proven that the approx. 25% to 30% of the construction cost, including material & labour cost can be reduce using this method respectively.

Mass housing target can be achieved by replacing the conventional method of palcing and executing building operation based on special and individual need and accepting common denominator based on survey, population need and rational used material and resource adoption of any alternative technology on a large scale need a garunted market to function and this cannot be establish unless the product is effective and economical. Partial fabrication is an approach toward the above operation under controlled condation.the essence lies in the systematic approach in building methodology and low cost housing is to be of intermeadiate type- less sophisticated involving less captial investment.

In this study,alternate construction material where studied and the potential of these material to be used and alternate building material brought out. Depending on avalability of the material particular region, these materials can be selected as transportation consist approximeterly 30% of total construction budget in most devolping countries, the challenge is to organize and initate measure that promote these material as well as train local been artisans and masons in the construction thechniqe involving this material.

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