Study of Environment Friendly Material Technologies for Low Cost Housing

Jitendra Dhanguh1 Madhulata Gajbhiye2 Gopi Sahu1 Atika Ingole1,2,3,4
1.2,3,4Department of Civil Engineering
1.2,3,4J.D. College of Engineering and Management India

Abstract— the project aim is to the methodologies and techniques with deals with budgeting and cost of construction by using proper management and source. The standard construction can be made using environmental and eco-friendly materials, hence it is important to construct houses in affordable cost. In India there is dream of owning good sustainable houses particularly for middle class families. So by using this project it will tremendously help to build strengthened and slandered durable construction.

Key words: Reducing Cost, Improve Technology

I. INTRODUCTION

The name “low cost housing “itself explain measuring of its cost low cost housing. In general can be define as the process or method of constructing houses with a use of low cost material and low cost techniques resulting into the economical housing to fulfil the maximum need of poor people.

Through it is named low cost house of the poor people made with quality and durability of structure low cost. The standard building research institute (CBIR) Roorkee have introduce different low cost material like fly ash brick, sand, lime brick, rice husk, ash and many more by adopting low cost techniques substitute for roofing low cost sanitation etc. it is easier to construct mass house in small duration of time.

The low cost housing means not only the reduction in cost or just cut down carpet area for building down the cost or using cheaper specification of material causing of strength and durability. The low cost housing refers the residential facilities of optimum cost feasible for different income and buyers under good satisfactory environment.

Thus as per ministry of work and housing. The low cost housing can be termed as agglomeration of these dwelling where in the space available. The expected life span and the available service are either just at minimum acceptance level or marginally below them which could fulfill the needs of economically weakness section of the society who are either able to offer the house of their owner in a position to bear a full economic thud involving the element subsidy

II. LITERATURE REVIEW

A. Bakhtyar, A Zaharim, K Sopian,S Moghimi
This research is an overview to Malaysia low-cost housings need and Malaysian approach to low cost housing. In this study the process of a sample lch has defined and barriers and difficulties in construction lch has discussed.

B. Jenny Mattsson (June 2, 2009)
This study has resulted in sustainable low cost alternatives to the current building technology that the local builders can benefits from Tradition is strong in Tanzania and changes may take long to implement.

C. Phillip O’Neill (July 2008)
The role of supply side impedements to housing development that contribute to loss of affordability concerns.

III. SCOPE

Low cost housing scheme provides in understanding for the importance of living standard of people residing in slum. This scheme provides an idea of low cost housing to engineer and architects without compromising for the strength of building or structure and utilizing the low cost techniques and material which result in good serviceability of a structure with economizing the construction cost.

IV. CONSTRUCTION TECHNIQUES FOR LOW COST HOUSING

A. Foundation
The site being rocky, sloping, uncoursed rubble masonry with boulder murum filling, in laid to prepare a flat ground for the structure. Ground level to plinth level work is in UCR masonry 380 thick. At plinth level, 100 thick RCC Damp Proof Course is provided, to counter the earthquake forces. Sill level is taken at 900 mm and finished by PCC band.

Fig. 1: Foundation detail

B. Wall Tiles

1) The work of saving the old walls had to be given up. CSV started applying the principle to new structure where this skin would be better anchored to a stronger backing. The approach led us to making our own blocks. After trying a large number of proportions CSV decide the following one to be the best for making the blocks.

2) The face tile is made of burnt clay measuring 230 X 100
X 12mm with 25mm key. One man can make 250 tiles per day, which can be baked locally by a village potter. Each face tile costs about Rs. 1.00 if manufactured manually at site.
C. Flooring
Flooring is IPS (Indian Patent Stone) finished in green colour, with brick red borders.
Alternatively, flooring can also be, mud or terracotta tile or stone tile, finished.

D. Roof
The Roof is permanently insulated without wood and steel. The roof consists of a series of arches made of burnt clay tile inserted into one another.
The arches are held together by plaster from outside and fixing of broken china tiles over it, which also renders it waterproof and reflects the sunlight making the interior to remain cooler.

E. Doors and Windows
Door Window frames are fabricated in mild steel, with horizontal guard bars and fixed in position by holdfasts to the brick columns. All door shutters and window shutter are in M.S. sheets, or all doors are in ply block board. Wooden door frames consume a lot of timber, and become very expensive in the in the process.

V. Construction of Common Wall
1) The wall between the two unit being an internal wall on either side, could be built with plain blocks. a. Soften the mud in the joints with forced sprinkling of water.
2) Rake out the in the tile joint with a specially shaped rod and clear the debris.
3) Clean the joints once again by generous sprinkling of water.

VI. Piers and Ring Beam
1) Lay uncaused rubble masonry 450mm thick up to plinth level.
2) Carry the brick piers up to the lintel height of 1.80m.
3) Fix precast door blocks in the brick piers, 2nos. per door. Finish the mortar joints with flush pointing simultaneously.
4) Fix up shuttering for ring beam and cast the 1:2:4 rings beam 524X 75 thick all round.
5) Fix up shuttering for ring beam and cast the 1:2:4 rings beam 524X 75 thick all round.
6) Make sure to have the chajjahs slope towards outside. Lay brick masonry chair at spring points placing tumbler bow.

![Masonry Chair](image)

**Fig. 7: Mansory chair**

**VII. MATERIALS USED IN L.C.H.**

- Mud- (Use as binding material, available naturally in the region).
- Stones (black basalt stone is used and it is easily available but difficult to work with it because its strong in nature).
- Lime (it is traditionally use in villages to paint the walls and also simultaneously use to mix with soil is 10% to give the strength for soil).
- Wall tiles (this tiles are made by potter, material is available to the region).
- Burnt brick pillars-std. size if this bricks is 9’x 9’x 4’. (to avoid the use of timber as the load carrying frame work we resorted to brick pillars, because the pillars ).
- Tumblers (replacement of timber without resorting to steel and this also made by potters at C.S.V. research).

**VIII. PLAN OF LOW COST HOUSING**

![Plan of Low Cost Housing](image)

**Fig. 8: Plan of Low Cost Housing**

**IX. COMPARISON OF LOW COST HOUSING AND CONVENTIONAL HOUSING**

1) After comparing the rate estimate of L.C.B. & C.B. the total cost of low cost building is Rs. 1,50,462/- and the cost of conventional building is Rs.4,92,530/- by using long wall and short wall method.
2) The construction of low cost housing is done in 20 to 30 days. And it reduce the 30 % cost as compare to conventional building. And gives equally life span and strength as conventional building.

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**X. CONCLUSION**

1) In an objective to build low cost housing is cost reduction is to be achieved without making any compromise on the quality of material used and resulting product.
2) Low cost housing is a step towards the improvement of the people living in a slum for the improvement of the living standard of this people.
3) This is considerable reduction in construction cost and time by using techniques which are utilized in this scheme ‘Low Cost Housing’.

**REFERENCES**