

Guidelines for Implementation of Cost Effective Technologies in Housing

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Abstract: *Man has always built with natural materials. Architecture today is dominated by cold hard, machine made building materials. While all previous attempts to replace these with a more plastic, environment- friendly material have resulted in a negation of the structural/technical dimension of Architecture, building with cost effective locally available materials offers the unique possibility of a innovation as well as saving in cost. Therefore cost effective design is important at every level of human life. The individual, urban and rural neighborhoods and whole nations shall adopt cost effective strategies for the development of our economy and environment.*

Keywords: Cost effective, Design, Housing, material, Technology, Architecture

1. Introduction

Housing is one of the basic requirements of any individual next to food and clothing. All of us dream for owning a suitable house in our life span. In today's context when India is heading towards economic growth and entering into an era of overall development, it is more than essential that we create an enabling environment for affordable housing for one and all.

1.1 Problem Faced

There is also increase in cost of construction materials and labors due to many reasons like money inflation, increase of energy cost, company competitions, political influences, immigration etc. The awareness of new techniques is not reaching to the public. The cost of construction is increased by 50% over nominal inflation due to hike in cost of basic building material and labour in a span of 20 years. Nowadays many cost control techniques are being introduced in project works to optimize the project cost.

With the advancement of technologies, it becomes necessary to have a critical examination of various technique and construction materials, at periodical interval, so as to discard ineffective construction practice and materials and adopt newer effective techniques and materials.

2. Reason for Cost Effective Construction

Cost effective housing is a new concept which deals with effective budgeting and following of techniques which helps 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

There is huge misconception that low cost housing is suitable for only sub standard works and they are constructed by utilizing cheap building materials of low quality. But the fact is that Cost effective housing is done by proper management of resources. Economy is also achieved by postponing finishing works or implementing them in phases. Every Builder or architect understands the importance of reducing the construction cost. In very recent years the cost

of construction has increased faster. The rising cost of shelter is the present scenario in housing, which affects all of us. Cost of Project depends on various Major and Minor heads of expenditure. These can be classified into two parts:

- Direct cost
- Indirect cost

Direct cost: It is defined as the actual expenses incurred on the construction project. It includes

- Land cost
- Material expenses
- Labour expenses

Indirect cost: It is defined as the correlated expenses incurred for the construction of building other than materials, labour and land cost. It includes

- Sanction expenses
- Plot development
- Site development
- Consultancy expenses
- Administrative expenses
- Site running expenses

3. Implementing Cost Effective Construction

Cost effective is a new concept which deals with effective budgeting and following of techniques which help in reducing the cost of construction through the use of locally available materials along with improved skills and technology without sacrificing the strength, performance and life of the structure.

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Cost effective technology allows for reduction of costs and preserve scarce resources. Cost Effective is achieved through four ways

- By replacing conventional materials with alternative materials
- By good construction skills which also heads to cost saving

- By proper building design which in turn leads to reduction in cost
- By proper planning and management of construction

3.1 Design

- Design of houses must be with expansion possibility and must ensure light and ventilation even after the expansion is made.
- The units must have minimum number of habitable rooms and temporary service rooms.
- Avoid unwanted decorative work.
- Reduce plinth area by using thinner wall concept
- Preplan every component of a house and rationalize the design procedure for reducing the size of the component in the building.
- Wherever possible the house must be designed so that the minimum number of costly conventional elements used in the design is minimised.

3.2 Materials

- Maximize the use of locally available building material to complete the construction of houses within the limited resources.
- Use locally available material in an innovative form like soil cement blocks in place of burnt brick.
- Use energy efficiency materials which consume less energy like concrete block in place of burnt brick.
- Use environmentally friendly materials which are substitute for conventional building components like use R.C.C. Door and window frames in place of wooden frames.
- By planning each and every component of a house the wastage of materials due to demolition of the unplanned component of the house can be avoided.
- Option table must be prepared at market rate with different material combinations and must be shown to the beneficiaries.

3.3 Technologies

- Various Cost effective technologies must be employed in mass housing schemes for the people below poverty line.
- Techniques must ensure beneficiary participation on self-help basis for construction, maintenance and also in future expansion.
- The beneficiaries must consult and seek help from NGO's for the construction of houses by using cost-effective techniques and appropriate usage of alternative materials.

4. Design Recommendations

- Reduce plinth area by using thinner walls
- Frequent changes in design should be avoided
- Building should be in regular shapes such as square, rectangle
- Basement area should be minimum
- Rationalize every component of house so that chajjas and balcony sizes are reduced

- Pre cast lintels to be used
- Ceiling height to be kept as minimum as possible
- Minimum sunken slabs for toilets and kitchens
- Use of other low cost and alternative building materials
- Avoidance of timber is must. Because for constructing 1000 sq.ft house it takes nearly 16-18 well grown trees for door and windows frame and shutters. Hence it should be replaced.

5. Conclusion

The above list of suggestion for reducing construction cost is of general nature and it varies depending upon the nature of the building to be constructed, budget of the owner, geographical location where the house is to be constructed, availability of the building material, good construction management practices etc. 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 to the extent of 25% in actual practice.

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