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Affordable Housing Using Smart Solutions

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Abstract: ***The growth of Indian construction is going to accelerate to fulfill (meet) the need of future generation, time effective and achieving advance technique. The paper based on use of different smart solutions for providing better living conditions to people in affordable price. Use of Solar Energy grid system to reduce the energy bills as well as use of precast technology to reduce the cost of construction. Precast construction technique enhanced the quality of work, save time, reduced the cost of construction required for maintenance of work. The Solar Grid Systems will help people to generate energy and supply it to main grid, reducing their bill as well as in possible future nullifying them. This paper reviews and summarizes the benefits and advantages of smart or eco-friendly solutions in making affordable housings more economic.***

Keywords: Affordable Housing, Smart Solution, Solar Technology, Solar Grid Systems, Precast Technology.

I. INTRODUCTION

There is no clear-cut definition term 'affordable', as it is relative concept and could have several implied meanings in different meanings in different contexts.

According to the RICS Report on Making Urban Housing Work in India, affordability in the context of urban housing means provision of 'adequate shelter' on a sustained basis, ensuring security of tenure within the means of the common urban household. It is very important to have a shelter of our own. Major population of our country is below lower income group.

Low cost housing projects for affordable living are major concern for the government. Indian government have started affordable housing scheme as a pilot project collaborating with public & private partnership in states of Maharashtra, Rajasthan, Kerala, Andhra Pradesh & Telangana. In this state of the art literature review; construction of low cost housing in India is studied.

As the current scenario of affordable housing is based on just providing subsidy on houses, through this research we are trying to make energy also affordable with housing.

II. METHODOLOGY

A. Literature Review

We have studied some research Paper, Books related to Affordable Housing, Precast technique, Solar Energy Grid Systems.

B. Case Study

To Study About the Solar Energy Systems I have Studied this Case Studies:

1) CIDCO Mass Housing Project Using Precast Technique.
2) SOLAR POWER Case Study – WEBBER HOME

C. Analysis

In this work by reviewing, studying about the benefits of solar grid system and calculating the cost reduction in energy bills also the recovery of initial investment is done.

The various papers on precast technology that are studied helped in implementing the more efficient, time saving and economic method for construction where it is feasible

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III. COMPARITIVE STUDY OF PRECAST TECHNIQUE AND CAST IN SITU CONSTRUCTION

The most important aspect of any building is concrete and its strength. There are different methods of concreting like a conventional method called cast-in situ method and the other is called precast concrete method. In cast-in-situ method, concrete is prepared on the site and in precast method, it is casted in a factory away from the site and is transported to the site for Installation.

General Comparison of Precast andCast in Situ

Particular	Precast	RCC
Construction speed	Very rapid speed of erection. Rapid construction on site.	Comparatively slow construction On site casting, so reinforcement laying & fixing, and formwork.
Quality control	Good quality control	Quality may affect due to site conditions, due to bad supervision, unskilled labor.
Environmental conditions	Weather is eliminated as a factor-you can cast in any weather and get the same results	Environmental conditions like temperature, humidity can affect on performance of Concrete.
Labor Requirement	Less labor is required and that labor can be less skilled	More Labors required on site in case of RCC.
Manufacturing conditions	High quality can be achieved because of the controlled conditions in the Factory.	RCC is too casted on site & the site conditions are not regularized, so it may affect on strength.
Durability	Under controlled condition concrete is extremely durable RCC is sufficiently durable	durable but it required proper quality control.
Size & Shape	Repeatability-it's easy to make many copies of the same precast product;	In-situ concreting is suitable where the building is in uneven Shape & there are no repetitive shapes
Connections	Connections are simpler	Connections may be difficult
Size Limitation	No limitation for size	Because panel size is limited, precast concrete cannot be used for two-way Structural systems.
Cost	It is comparatively economical when the building having no regular shapes.	Economics of scale demand regularly shaped buildings.

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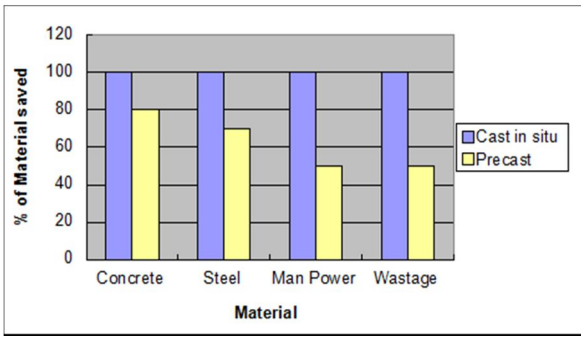

Benefits of Precast

A. Cost Analysis

Precast is an ideal solution for constructing a residential building due to the production of similar types of elements repeatedly in bulk, thus reducing cost. Pre-cast concrete provides durability, flexibility and sound durability with cost efficiency. Maintenance cost is also less in precast system. Cost of precast may vary with the type and the size of construction. For a small project the cost of precast increases due to no production of elements in bulk. However, for bigger projects the cost may decrease Significantly Cost of construction is less in large size Projects in precast as production is in bulk quantity so labour cost, steel, concrete wastage and also finishing item cost will be less as compare to cast in situ. But transportation cost may be higher depend on distance between precast factory to construction site**.**

B. Time Analysis

Sr No.	Description	Duration
1	Sub Structure- (Site Cleaning,Earthwork , Soil Filing)	15
2	Foundation	8
3	Super Structure-(Wall Panel , V beams , Plinth wall and roofing slabs)	30
4	Finishing Work- (Electrical, Plumbing, Painting, Tiling, and Windows)	35

Total Duration of Prefabrication Construction

Sr No.	Description	Duration
1	Sub Structure- (Site Cleaning, Earthwork Soil Filing)	15
2	Foundation	21
3	Super Structure-(Column Lintels & Sunshade, Beams, Roof Slabs)	50
4	Finishing Work- (Electrical, Plumbing, Painting, Tiling, and Windows)	45

Total duration for Conventional Construction

IV. ANALYSIS OF SOLAR GRID SYSTEM

The Solar Grid System helps in producing Green Energy as well as reduces the electricity bill of citizens. Also in hopeful future it will nullify the bill and the apartments may start earning profits as the energy conversion growth will be exponential.

V. CONCLUSION

From all this study I conclude that,

A. Precast concrete system is economical than conventional cast in place method but still there are some conditions which we have to take care of while using precast, those are quantity of construction, Distance of site from manufacturing unit. Type of building etc.

B. We have identified that for standard & Repetitive work precast is the best option to choose. In observation the most important thing is to be observed project is in precast construction technique is the time effective it require less time to construct.

C. Solar Grid systems are economical in use, and will help to improve the affordable housing scenario in India in energy matters.

VI. ACKNOWLEDGEMENT

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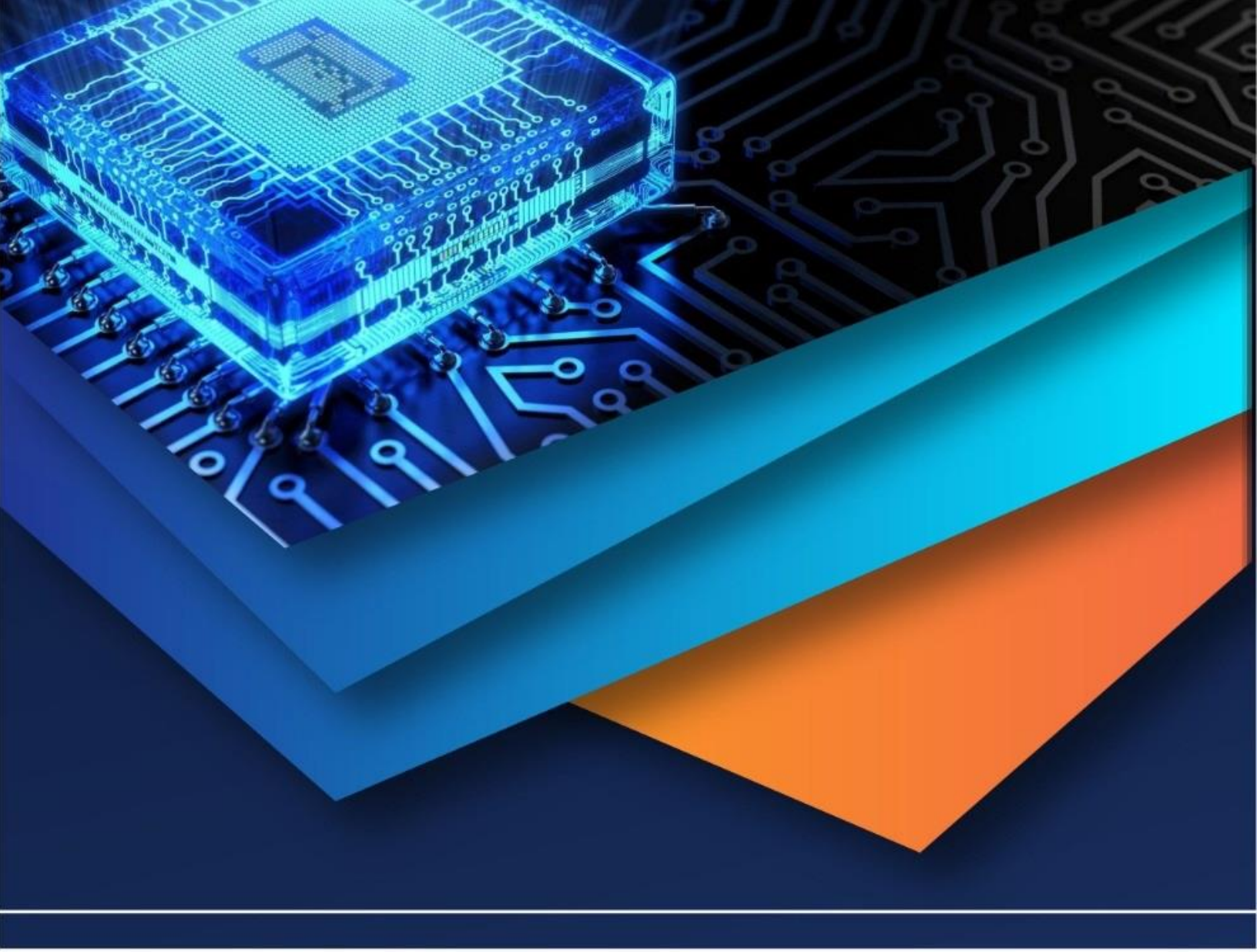

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