

## RCC Brick Less Building Construction

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### ABSTRACT –

Rapid urbanisation, tremendous shortage of skilled labour and the need for having hassle-free construction methods is a trigger to offer brick-less technology to build homes faster. Taking into account price increase of the four key construction components- steel, cement, labour and bricks - there is an 18 per cent gross rise in construction cost over the last two years (2011 over 2009). This escalation will corrode the profit margins significantly, therefore brick less technology will play a major role in assisting the developers to plan accurately and reduce the risk of fluctuation, enabling them to forecast and plan cost, anticipate return on investment and evaluate the impact of increased delivery commitment on developer's reputation. This project deals with the brick-less building construction. Brick-less construction will boost the growth of India since it will fulfil the nation's needs for housing in future. It will be suitable for all kinds of construction requirement, right from small housing projects, to villas, to commercial structures.

**Keywords-** material handling, formwork, raft foundation, plant and machinery, brick-less technology, technology, mass housing.

### 1. INTRODUCTION-

India is growing at 9% per annum since 2000 and is currently the second fastest-growing economy in the world. The Indian construction industry has been playing a vital role in the overall economic development of the country, growing at over 20% CAGR over the past five years contributing 6.5% of GDP .

### Overview of augmented reality-

Construction accounts for 40-50% of the investment which means Rs. 2,00,000 crores in the next five years or Rs. 4,00,000 crores every year. UN Habitat reveals that three billion people will require basic housing in the next 24 years. As a result, the demand for housing will be 96,150 houses per day or 4,006 houses per hour.

This technology saves the hassles of brickwork, hollow-block and plastering. It can be very well integrated with conventional columns and beams. Usage of brick-less product leads to substantial weight reduction (dead load), improved fire rating and maximum sound absorption.

Most of the development is expected in the tier 2 and 3 cities like Ahmedabad, Pune, Jaipur, Vadodara , Lucknow , which is where the teeming Indian middle-class lives. As the Tier 1 cities start to get saturated and affected with over population, the growth in Tier 2 cities offer humongous potential as they already possess the basic amenities required to establish business. And, to help meet the mounting need of delivering faster and better quality, it's important to replace costly aluminium and plywood frameworks.

### Increased Delivery Commitment

UN Habitat reveals that 3 billion people will require basic housing in the next 24 years. As a result, the demand for housing will be 96,150 houses per day or 4,006 houses per hour. Utilization of this unique wall system is 10-15 times faster than a conventional brick wall system in the basic erection. i.e.: A skilled mason team can erect upto 60 sft of brick masonry in 1 day whereas upto 800-1200 sft of Smartboard wall can be erected in one working day by a team of Smartboard Wall installers. Now you can imagine a house within six months to a year for high rise and around 45-60 days for a duplex villa. The clean building systems in brickless technology

is the fastest concrete walling system in the market, ideal for both hot climates and for insulation in cold temperatures as well.

### Research methodology-

In this section articles are classified based on their research methodology which is divided in five categories: case study, experimental/empirical study, proof of concept (or proof of principle study), questionnaire (survey/interview), and literature review. A case study is a research method in which detailed consideration is given to the development of a particular case over a period of time. An experimental or empirical study is an empirical scientific method in which an experiment arbitrates between competing models or hypotheses. A proof of concept or a proof of principle study is a research method in which a certain method or model would be recognized to demonstrate its feasibility or to verify that a certain concept, theory, or prototype has the potential of being used.

This project is the case study of

### SARGAM HOUSING PROJECT

jankipuram sector-j

kursi road, lucknow

CLIENT-lucknow development authority

ARCHITECTS-arinem

it includes the general procedures like survey of material handling ,formwork, raft foundation, plants and machineries , storage of materials used and general tests- fineness test of cement ,normal consistency test, soundness test, initial and final setting test, hot plate test and compressive load test that were conducted at the site. It also deals with role and responsibility of accountants and administration department.

At the SARGARM HOUSING PROJECT the labour cost was significantly reduced by using proper techniques. The building construction cost can be divided into two parts namely:

Building-material-cost: 65 to 70 %

Labour cost : 65 to 70 %

Now in low cost housing, building material cost is less because the company make use of the locally available materials and also the labour cost can be reduced by properly making the time schedule of our work. Cost of reduction is achieved by selection of more efficient material or by an improved design.

Item	Particular
Salient Features of Job	FLATS-720 CV – 205.51 Cr DURATION – 24 MONTHS
Contractual Project Start Date	03-Dec-2011
Contractual Project End Date	15-Dec-2015
Basement and sub structure Area	2,79,864 Sqft
Super Structure Area	9,41,223 Sqft
Sales price per sqft ( Basement and sub structure)	INR 1150/Sqft
Sales price per sqft ( Super Structure)	INR 1625/Sqft
Client	Lucknow Development Authority
Consultant	EDRC- Chennai
Architect	Arinem Consultancy limited.

Job	Type of Contract	Lumpsum (Rate/Sqm)
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## Overview

### LITERATURE REVIEW-

In the developing countries like India it is a huge challenge for the government to provide shelter to the huge majority of people. Hence the government will have to find a way so that they can provide cheap and affordable housing to the countrymen for that they have to look for such technology which is cheap as well as safe so that all class of people can be benefitted from it.

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. The fact is that Low cost housing is done by proper management of resources. Economy is also achieved by postponing finishing works or implementing them in phases.

Brick-less buildings are an outstanding technique for construction of mass housing project. In the recent past, there have been increasing demands for structures that are sustainable, and meet safety, security and environmental considerations

There are many papers journals published by so many researchers which defines the use and benefits of using all RCC walls instead of brick wall. there is a misconception that the RCC walls will be higher in cost but it is not like that it saves the cost of finishing and plastering and it also decreases the labour cost and speed up the construction. Following papers were presented by different engineers and researchers regarding the the use of brick-less technology

**Brick-less construction may play a big role in meeting increased demand for housing** - Written by Feroz Khan (Director, Fabtech Sterling)

A Breakthrough Construction Technology and Its Impact on India's Growth- written by Ar. Harsh Bhutan

**Low cost housing**-Civil Engineer Portal

**Brickless buildings solutions**-Moladi building communities' estd. 1986

**Brickless and green buildings**-Brotin banerjee

### CONCLUSION-

There are many tall buildings coming up with the framing system (all walls in RCC) nowadays. the advantage is that there will not be any projection inside the rooms, architect/end users are happy. speed of construction increases rapidly, will have better finishes , better member joints, increase in the usable carpet area , much stiffer structure to resist wind effect, and abundance of shear walls in both directions to resist seismic forces etc.

The disadvantage is that no future modification or breaking of walls , partially or fully is possible. also the need of skilled labours, good quality control , proper design and detailing, and no more changes once the construction has started.

The cost of construction does not increase much, and found that in some cases, there is actually a reduction in overall cost.

### GREEN INDIA

Brick less construction will boost the growth of India since it will fulfil the nation's needs for housing in future. The production process in brick less technology is incorporated under 'Green Policy' in the attempt of making India PURE.

### RECOMMENDATION

India today is witnessing a paradigm shift. Technology has positively affected our lives and has made a breathtaking change. Looking at the construction growth, resources are not appropriate; Hence India needs to

go with technology that delivers better quality and longevity. Rapid urbanisation, tremendous shortage of skilled labour and the need for having hassle free construction methods is a trigger to offer brick less technology to build homes faster

Since the country has an unmet housing shortage of approximately 26 million units. Therefore it is necessary that the government should start focusing on new technologies of housing construction to meet the need of shelter in future. Government should promote brick-less buildings and green building because it is sustainable, safe and meets all the environmental consideration. Tax relaxation should be provided to all those developers who build houses with latest techniques and works for sustainable development of the country. Various companies should start using the new methods of construction rather than using the same old conventional techniques. It's time that we should give bricks a break.

### Authors' contributions

Each author contributed extensively to the work presented in this paper. Ragini Shikha searched the databases, selected the articles, reviewed and analyzed the literature, and prepared the manuscript. Ajay Sunil defined dimensions and categories, supervised the overall review, and edited the manuscript. Each author read and approved the final manuscript.

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