

Brickless Construction- Brick Free Building System

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Abstract - In today's world, due to rapid urbanization, shortage of skilled labour, increase in housing demand and shortage of houses has led the construction industry to look for alternative methods of construction which saves time and money, need less amount of labour and are easily available for all. The construction of residential housing accounts for 75% of the total construction in India since the construction industry is the 2nd largest industry after agriculture. Construction industry accounts for 8% of India's GDP. In this project, a building construction without brick wall monolithic large panel wall made up on site on the building.

The basic process is as follows: The still channels are mounted between floors for positioning I shaped vertical beams are mounted to formed initial footing for wall, thermal insulating layer is additionally filled, backing plates for thermal insulating layer are mounted, still wire net connecting post is inserted for laying still wire net are tied together with ion wire & concrete surface layers are paved and coated on two sidal surfaces.

Index Terms - aluminium formwork technique, conventional technique, brickless construction, mass housing, economic construction, high-rise building, wall thickness, comparison of alu-form I.

I.INTRODUCTION

In India there is an increase in housing demand and a shortage of housing. Every person desires a housing unit but not everyone can afford one. There is an increasing demand for structures that are sustainable and meet the safety, security and environmental considerations. The use of various types of formworks like Aluminum Formwork, Plaswall and Plastic/Moladi are the brickless techniques of construction which can overcome the parametric drawbacks of conventional method of construction, like wall thickness and carpet area. The above-mentioned parameters affect the quantity of materials

like concrete, steel, formwork, plaster, etc. and their individual costs which directly affect the total cost of the project.

II.REVIEW

Priyan Mendis (2019), studied the safety features and time management for modular construction for brick-less techniques and concluded that it offers faster and safer manufacturing, better predictability to completion time, superior quality, less workers on site, less wastage of resources and more environmentally friendly solution than the conventional method by critically reviewing the recent development, performances, challenges and future opportunities of brick-less construction.

Mr. D. M. Wijesekara (2012), studied the cost effective and speedy construction in high-rise buildings using aluminum panel formworks and thereby concluded that the brick-less technique of Alu-form construction is most affordable for mass housing and there is less waste disposal, and the formwork system can be used again for another project. A very high-quality concrete surface can be obtained by using this method and hence, this too, reduces the cost.

Wahid Ferdous, Yu Bai, Tuan Duc Ngo, Allan Manalo, Priyan Mendis (2019), studied the safety features and time management for modular construction for brick-less techniques and concluded that it offers faster and safer manufacturing, better predictability to completion time, superior quality, less workers on site, less wastage of resources and more environmental friendly solution than the conventional method by critically reviewing the recent development, performances, challenges and future opportunities of brick-less construction

III. OBJECTIVES

1. To prove that Alu-form, Plaswall and Plastic Formwork are most-effective for mass housing.
2. To calculate wall thickness and carpet area (m²) of Aluminum Formwork Technique.
3. To analyze and compare safety, quality, cost and time of Aluminum Formwork and Conventional Method.

IV. SCOPE OF STUDY

1. In a building constructed using Aluminum formwork, wall thickness is less than the Conventional method. Hence, quantity of material and their corresponding cost is less.
2. Total carpet area is more in Brick-less technique than the Conventional method as the wall thickness is less.
3. Aluminum formwork can prove to be cost effective after at least 50 repetitions.
4. Since the total structure is made of concrete, it offers better reliability, safety, strength and longer life.
5. Total estimated cost of the structure is less than conventional method especially for high rise structures.

V. METHODOLOGY

1. Materials required.
2. Quantity estimation.
3. Wall thickness and Volume.
4. Carpet area calculation.
5. Time and Cost optimization.

VI. CALCULATIONS AND RESULTS

The following calculations are done based on our case study of a high-rise residential construction project called Upper nest in Mulund (E), Mumbai:

1. Materials required: ALUMINIUM FORMWORK
M25 Concrete, Aluminum Formwork, Steel

2. Quantity Estimation:

MATERIALS

ALUMINIUM FORMWORK

M25 Concrete -4.576 m³

Formwork- 332.44 ft²

Steel- 830 kgs

Brick Masonry ----

Plaster ----

3. Scrap Values of Various Formworks:

Sr. No.	Formworks	% Scrap
1.	Plywood	15%

Here, we can see that Aluminum Formwork offers maximum Scrap Value.

VII.PHOTOS



VIII. CONCLUSION

Alu-form technique can prove to be extremely economic and cost-effective as compared to conventional method of construction as Aluminum formwork panels can be used for up to 250 repetitions. Hence, Aluminum formwork technique shall be used for high rise building constructions, typically for buildings which have same structural plans for apartments on each floor. It should also be used to decrease the housing demand for the increasing population while providing low-cost housing units for all.

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