

# LITERATURE REVIEW ON COMPARATIVE ANALYSIS OF ALLUFORMWORK AND CONVENTIONAL FORMWORK IN PUNE REGION

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**Abstract** - The formwork is playing an important role in construction industries so the selection of formwork is too much important, so many option available in market but before selecting any kind of formwork initially think about the type of project, budget of project, what quality required, in which time period we have to complete project, is that formwork is being safety, feasibility of form work. Because wrong selection of form work become difficult to complete the project on time and set quality also hampering budget.

Alluformwork system identified to be sustainable for Indian condition for mass housing construction where quality and speed can be maintained at reasonably high level. Formwork system are among the key factor determine the success of construction project in terms of speed, quality, cost and safety of the works the rapid advancement in the field of formwork along with the innovation in concrete as a change more efficient construction is possible these day the alluformwork system saves cost, time and improves the quality of construction alluformwork is successfully used in japan, Singapore, Malaysia, and middle east of the construction of apartment and buildings, both low and high-rise. Allufoemwork system is very cost effective.

**Key Words:** Alluformwork, conventional formwork, time, cost, quality, safety, Activities.

## 1. INTRODUCTION

As everyone knows the formwork is temporary structure which is used for to support the concrete until and unless it get become set. Also formwork is use to attain required strength and shape which we want. There are multiple option available in market but everyone have some criteria

According to our need we have to select. Definitely costing is vary according to material or technology of formwork for example wooden form is cheaper than alluformwork or steel formwork.

Now a day competition is increases so according to everyone try to complete our project in fix time period with better quality and costing of project is in budget or pocket

friendly so that better product can serve to client so that they will happy

As we know everyone get attracted to latest technology so that everyone want to do our project in latest technology so that client can attract easily.

Some project have time limit have no effect of cost in that case they divert in to latest technology for reduce construction time period.

## 1.1 AIM

To increases or divert the mentality of people in alluformwork instead of that conventional formwork and its awareness

To show how we can optimize the construction cost, time, multiple activity by using alluformwork.

## 1.2 OBJECT

Study different type form work on residential structure.

To study advance technique of form work like alluformwork.

Comparative study of cost benefit analysis of alluformwork.

## 2. NEED OF FORMWORK STUDY

Modern civilization getting support in construction of buildings for making our life easy. Since its start modern technology plays an important role in construction industries. Those having ability to plan / design and construct building digitally has significantly increases speed and efficiency to reduce construction cost at the same time

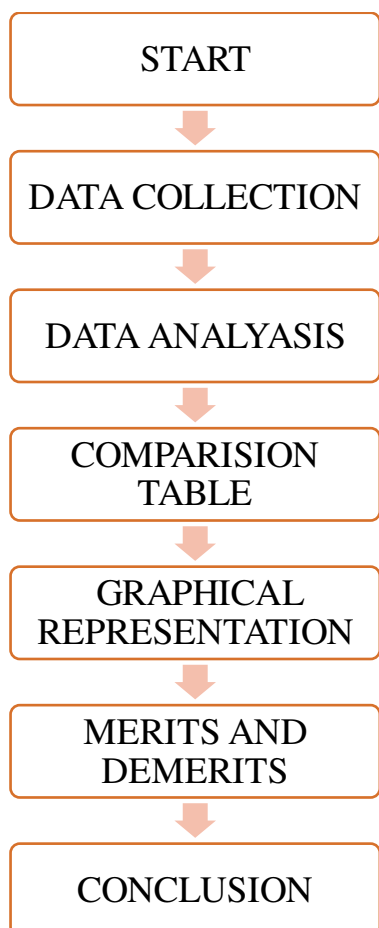
Additionally, the material that are used in construction industries are stronger, more flexible and durable, allowing for more sustainable structure that are safer and more environmentally friendly. With better quality. Professional concrete construction means using formwork and the task of creating this article and modern project should be so experienced.

## 2.1 SCOPE OF PROJECT

Scope of the project will be limited to alluformwork in residential project in pune area.

### 3. METHODOLOGY

First collected the materials like literature review and latest published papers related to comparative analysis on conventional formwork and aluformwork, it many contains live and completes project case study by using aluformwork and conventional formwork.



### 4. REVIEW OF LITERATURES

The following are the previous research review based on comparative analysis of alluform and conventional formwork.

#### Paper 1.

Ninjal M Parekh, Bhupendra Marvadi, Umang Patel et al. (2015) this paper describes comparative study of conventional technique verses aluminum formwork technique. This paper focus on to reduce construction cost of the project, to reduce construction time of project, to measure and improve quality of project. paper have advantages of aluminum formwork regarding speed of construction, costing of formwork, environment friendly, light weight, labour consumption, scrap value of material. In this research paper done two different project case study on residential project and prepare different

chart and graphs regarding quantity wise, cost wise, time wise, quality wise. This paper conclude the aluminum form work is cost effective for mass and repetitive building, by using aluminum formwork can achieve high quality formwork and low maintenance cost.

Interpretation – In this paper focus on comparative study on conventional technique vs aluminium formwork technique in terms of time, cost, quality.

#### Paper 2

Hisham A. Abou Ibrahim, Farook R. Hamzeh et al. (2015) in this research the selection of formwork systems for high-rise buildings is study by their competence in minimizes concrete activities in an isolated manner, without affecting construction workflow. In this paper studies the role of advanced formwork systems in high-rise construction and analyzes this role in shaping not only the progress of concrete activities, but the all construction sequence. In this paper context, known research efforts do not address. In this research paper focus on background of high-rise building construction, repetitive construction in high rise building, formwork choice and construction work flow, formwork selection parameter.

In this research paper comparing advance and regular form work systems, plan and trace construction process and activities of construction.

Interpretation- in this paper focus on role of formwork in high-rise construction and study on different types of formwork and role of formwork in high rise construction.

#### Paper 3

Arbaz Kazi, Fauwaz Parkar et al (2015) this research paper shows to address the housing and transportation requirements of an exponentially increasing population, Indian construction industry has grown by leaps and bounds. In this paper stated comparative study and decision making for a formwork technique to be adopted on a construction site in Mumbai. In this research paper cover the advantages of different types of form work like H beam, Plastic formwork, Fiber reinforced polymer formwork system, aluminum panel system formwork, jump form or slip form system. Also collecting data like Mivan, Doka, Plastech, and RMD.

In this paper shows comparative statement of various formwork in manners of initial investment, repetition of cycle, cycle time for casting atleast 100 sq.m., strength in kg/sq.m, durability of material, surface finishing, wastage of material, planning system, accuracy of system, wastage of materials, manpower requirement, training program.

In this paper concluded the plastech formwork is best solution for the project also doka, peri, rmd also consume less time period, mivan formwork is not taken in consideration as the initial cost is high, its beneficial only where the mass construction

Interpretation- In this paper focus on comparative study and decision making for a form work technique to be adopted on a construction site in Mumbai. Also shows comparative statement of various formwork like timber, steel, plastech, RMD, doka, peri.

#### Paper 4

K. Longanath, K.E. Viswanathan et al. (2016) this research stated the selection of a suitable formwork system in high-rise building construction is a crucial factor to success the project on time. So that selection of formwork system to affects the entire construction cost, time and quality of construction. In this paper focus on the identification of different types of formwork, find out which factor affecting the selection of the formwork, to calculate and compare the formwork and equipment cost, duration and quality. In this paper considered factor affecting selection of formwork system like adoptability and flexibility, duration and repetition, quality and surface finish, availability, cost, safety, supply, types of structure, maximum load capacity, time factor, erection and dismantling, suitability of work for labours, weather condition, skilled labour requirement. In this research paper makes different comparative chart in terms time, cost, scrap value for aluminum formwork, wooden formwork, and steel formwork and make graphs for conclusion. In this this paper conclude from analysis , initial cost for aluminum formwork is high as compared to other but in terms of durability, quality, productivity and repetition of material its beneficial for mass construction.

Interpretation- In this paper focus on a study report on cost, duration and quality analysis of different formwork in high-rise building and consider wood, steel, aluminum formwork.

#### Paper 5

Shubham Deshmukh et al.(2017) This research explain mivan Technology is latest trend followed by developing and developed countries for mass housing projects. In India having vast population and having huge requirement of housing and for meet that requirement speed up construction and minimizes the time period. In this paper covers to increases workability over long period for mass concreting work, to increase compressive strength of concrete, to reduce shrinkage cracks of concrete, to reduced segregation and honeycombing effect at joints where dese reinforcement is provided

Interpretation- In this paper focus on a review paper on remedies to the common deficiency faced in mivan technology such as cracks, honeycombing, surface finishing, and strength of concrete.

#### Paper 6

Renuka S. Hangarge et al. (2017) this research contains study out to compare different type's formwork, construction cost, time. In this paper calculate result on 3 types of different case study on residential project contains aluminum formwork, conventional formwork, and tunnel formwork and making

comparative tables in terms of concrete qty, steel quantity, formwork quantity, gypsum, labour rate, concrete rate, steel, and brick work internal and external plaster and calculate cost per sq.m. and comparing each othe and concluded the aluminum formwork is cost effective than conventional formwork, aluminum formwork is effective the time effect the project, tunnel formwork is the most time and cost effective among the conventional, aluminum, tunnel formwork, time saving is equal to money saving even though the initial investment is large, tunnel formwork is suggested for fast construction speed.

Interpretation- In this paper focus on cost and time estimation conventional, aluminum and tunnel formwork.

#### Paper 7

Naveen V. Chikkaveerayanavar et al.(2017) –In this research paper cover selection formwork for a construction is selection on basis of repetition of formwork, initial cost of formwork, initial investment of formwork, time required for erection of formwork, suitability of formwork. The most of construction industries use aluminum formwork.in this paper contains deatails of conventional formwork, mivan technology, components of mivan technology, working of mivan technology, features of mivan technology, advantages of mivan technology, disadvantages of mivan technology , advantages of mivan technology over conventional formwork. In this paper shows case study on residential project and find out cost comparing with aluminum formwork and conventional formwork in terms of material cost, labour cost, number of repetition, slab cycle duration. And make graphical and table form results. In this paper conclude the mivan technology is use full for large project of multi storied building having 200 to 300 repetition in project so that cost of material is recover. In this technology gives smooth finish and better quality so that no need of plastering work.

Interpretation- In this paper show planning and scheduling system for multi storeyed building in terms of conventional formwork and mivan technology.

#### Paper 8

SS Asadi, PV. Praneeth et.al. (2017) in this research consider increasing requirement of housing due to rapid development so meet to that requirement to complete construction in short duration. In this paper thesis work is to identified the importance of selection of different formwork system, survey is carried out on different types of formwork from different types of contractor regarding time, cost, quality, slab cycle, number of repetition . in this research paper contains need of formwork, factor affecting selection of formwork system, types of formwork system like conventional formwork, steel formwork, tunel formwork, aluminum formwork. Advantages and disadvantages of types of different types of formwork on timber formwork, aluminum formwork, steel formwork, plastic formwork, mivan formwork, doka formwork. In this research paper done the questionaries' survey in various site regarding

aluminum formwork, conventional formwork, doka formwork, in terms of cost, safety, slab to slab cycle, stability of material, testing procedure, on site supervision, number of repetition, labour requirement performance of concrete

In this research paper concluded mivan gives highest number of reputation compare with conventional, faster construction can possible with mivan formwork.

Interpretation- In this paper shows a comparative study for evaluation of different forms works system utilization in construction project considering timber formwork, aluminum formwork, steel formwork, plastic formwork, mivan formwork, doka formwork.

#### Paper 09

R. Thiagarajan, V. Panneerselvam, K. Nagamani et.al. (2017)  
In this research

Paper one of the most important factor of the construction project in terms of speed, quality, cost, safety of the work. In this paper study aims to prove for the mass housing low rise construction aluminum formwork is best formwork in terms of safety, quality, cost, and duration over the conventional formwork. Also contains need of study, details about present technology available in India like prefabrication technology, tunnel formwork, aluminum formwork. Analyzing the current market trend in private sector, study on urban population set to outgrow overall population growth, study on state wise housing shortage in 2012, merits of aluminum formwork, limitation of aluminum formwork, design of aluminum formwork, components of aluminum formwork like slab components, wall components, beam components. In this research paper concluded the floor cycle is 7 to 10 days, by using aluminum formwork is not only faster rate of construction but also save 20 to 25 percent cost over the conventional method with lesser labour input, by using aluminum formwork over all project time duration is less and also project cost.

Interpretation- In this paper shows aluminum formwork system using in high-rise construction and analyzing the current market trend in private sector.

#### Paper 10

Anuj Patel, Vaishali Parmar et al. (2018) in this research show with the use of advance technology its importance to determine or study the impact of in any form for a construction industries at regular intervals. In this research paper contains types of formwork like timber formwork, steel formwork, aluminum formwork, peri formwork. Doing case study in Gujarat region and Ahmedabad city. Showing comparative table with different types of formwork like timber formwork, steel formwork, aluminum formwork, peri formwork in terms of initial investment, initial cost per sq.m., props and accessories cost per sq.m. transportation cost, labour cost, repetition cycle repetition cost/ sq.m., cycle time, strength kn/sq.m., durability, surface finishing, wastage of material, planning of system,

accuracy in construction, manpower requirement, training program. In this paper concluded the peri formwork system is to be best for the project and timber and steel formwork system is costly formwork.

Interpretation- In this paper shows to study about comparative technique of formwork to manage cost of construction considered timber formwork, steel formwork, aluminum formwork, peri formwork.

#### Paper 11

Azharuddin Ansari, Anwar Ahmad et al. (2018) in this research stated in affordable housing selection of formwork is important factor for the completion of project in less time the almost 35 to 40 percent cost goes to Rcc member. In this review paper study conventional and aluminum formwork. For small project conventional formwork is suitable and aluminum formwork is suitable for mass housing project. In government housing project scheme like Pradhan Mantra Awas Yojana required mass construction in short time with less construction cost in that case it's beneficial. In this research paper aluminum formwork is light weight and easy to handle, aluminum formwork have less cost as compare to conventional formwork, aluminum formwork is cost when its implementation for small scale project, aluminum formwork project have more seismic resistance.

Interpretation- In this paper shows a review paper on aluminum formwork and its utilization in affordable housing.

#### Paper 12

Vijay Anil Sonawane, Harshita Ambre et.al. (2019) in this research explain India is the developing country where rapid development in infrastructure sector is more important. So that advance construction technology implementation is important. For that aluminum formwork is implement over conventional formwork. In this research paper gives details of aluminum formwork, conventional formwork, line of balance technique, LOB scheduling. In this paper concluded the aluminum formwork is not only pays important role to complete the project in timely but also saving cost of the project, aluminum formwork is better option where timely completion of project required. Identify by using aluminum formwork complete the 10 houses project in 42 days and conventional formwork takes 65 days

Interpretation- In this paper shows comparative analysis of aluminum formwork building and conventional formwork building based on duration by using line of balance technique.

#### Paper 13

Swapnil M. Karke, M.B. Kumathekar et.al. In this research paper contains details of formwork scenario in India in manner of low technology, labour intensive, absence of monitoring body, conventional formwork, need of modern formwork system like mivan technology, tunnel formwork, climbing formwork, flex formwork, heavy duty tower system, slab formwork, column formwork system. Making table material



wastage in construction in term of formwork, finishing work, concrete work, masonry work, material handling, scaffolding, hording. Showing comparison table in mivan system, tunnel form technology, conventional formwork system in terms of speed of construction, quality of surface finished, preplanning of formwork system, types of construction, wastage of formwork material, accuracy in construction, coordination between different agencies, resistance to earthquake, need of any timber or plywood, suitable for high rise construction, initial investment in system, economy in construction. In this paper conclude the traditional formwork having more wastage, more safety prequaction taken so that construction speed also less, requires skill labour for each work, modern formwork is more speedy and having safe to work so that speed of construction can achieve. Modern formwork is more beneficial over the traditional formwork in terms of time and cost.

Interpretation- In this paper shows comparison of use of traditional and modern formwork system time, quality, and cost.

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