

“Review on Study of cost and time Optimization of building construction Project using Mivan Technology”

Vaibhav banker, Prof.P.P.Pale

*PG Student, Dept of Civil Engineering, JSPM Imperial college of Engineering and Research Wagholi, Pune 07.
Assistant Prof. Dept of Civil Engineering, JSPM Imperial college of Engineering and Research Wagholi, Pune.*

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ABSTRACT: Construction is one of the important sectors and an integral part of the Indian economy. Also, it is an important factor in the development of the country. India is eagerly planning for rapid production and construction of residential units for cost-effective construction facilities. Mivan is a relatively new construction technology that will come in handy for the successful completion of large-scale projects, especially in nature. In this paper we have discussed the cost and time comparison of Mivan technology with traditional formwork technology. Mivan technology is highly efficient compared to traditional technology by saving cost, quality and time. The basic idea is to come to a firm conclusion about the superiority of the two techniques.

KEYWORDS: Formwork, MIVAN, time and cost optimization, projects

I. INTRODUCTION

Mivan formwork technology is introduced first in Malaysia .by Mivan company Ltd. In year 1990s this Technology used for mass home construction in poor countries.

The aluminium forms provide a concrete surface finish that enables for a high-quality wall surface without the need for significant plastering. This is one of the techniques that has been identified as being particularly well suited to Indian conditions for large construction, where excellent quality and speed may be attained. The utilization of mivan formwork in the construction industry of India is comparatively very less as to the other developing or developed countries around the globe. The utilization of mivan formwork technology in construction industry has the greater potential. Mivan is one of the sophisticate demined formwork fabricated in Aluminum Monolithic pouring. Walls, columns, slabs & beam are poured together in particular system. This formwork as an

sophisticated construction material but it is also economical in type of construction. This recent method of construction by this technology can appreciably increase the productivity of Construction, built quality and durability of construction work through the use of efficient construction tools, construction materials, and time for construction saving compared to conventional technologies or methods. The strong concrete surface finish produced with the aluminium forms allows achievement of a excellent quality wall finish without the need for external as well as internal plastering. This particular system is identified to be very much suitable for Indian conditions for mass structural construction, where quality and speed can be achieved at excellent level that too at economical cost. The Mivan Technology System was developed by Malaysian company as a efficient system for constructing the mass housing projects in the developing countries. To be erected by the structural elements many time that to of a repetitive design, the system ensures a fast and economical method of construction. The speed of construction by this particular system will surpass the speed of most of the other recent construction methods and technologies used.

II. GENERAL SPECIFICATIONS AND COMPONENTS OF MIVAN

This produces include a sets of completely lightweight panel with an excellent stiffness to weight ratio also yielding minimal deflection under complete concrete loading. The basic elements included in Mivan Formwork are the sets of panels, which are a shear extruded aluminium rail section, fully welded to an aluminium metal sheet. These Panels are costumed manufactured in the particular size and shape to suit the complete requirements of specific types of projects. The formwork panels are made from very high strength aluminium alloy with

a minimum thickness of 4 mm skin plate and 6mm thick ribbing behind to fully stiffen the panels restricting them from falling apart. With the durability they also are very much light weighted so heavy lifting them is easy thing, the heaviest components is of 25 kg, so that human lifting methods are also possible. These mivan formwork components are very much durable so they can be efficiently used repetitively up to 200 times for the construction projects.

The complete length and breadth are measured out to out of walls excluding the plinth offset of the structure. The complete cost of the string course, cornice, corbelling etc., is neglected. Following are the some of the components that are generally used in the construction projects.

- a) Beam components
- b) Deck components
- c) Wall components

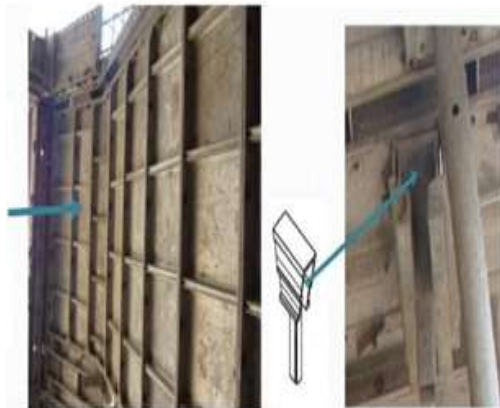


FIG 2.1: Beam side panel and Prop head

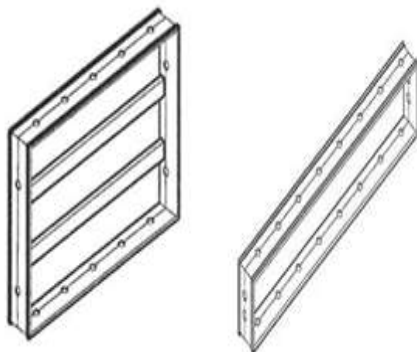


FIG 2.2: - Wall panel and Kicker



Fig 2.3: - Deck Panel

III. LITERATURE REVIEW & SURVEY Review

In all the research papers the author have studied and compared the Mivan Technology with the Conventional Technology. In some of the research papers the author have found mivan technology is economical whereas in some of the research papers the author have found the mivan technology is quite expensive than the conventional, this depends on type and scale of project studied. But the common advantage of all the research papers is that the Mivan Technology provide more durability, strength and construction period is also less and somewhere almost the half than Conventional Method of Construction.

Survey

Rehan Baji, Mayank Gupta (2021), attempts were made to investigate numerous elements that may influence the selection of advanced equipment, techniques, and materials for accomplishing the following goals: Early completion of structure, cost-effective equipment, technique, or material purchases, lowering the project's direct costs, and producing fewer environmental pollutants in the project's surroundings as a waste product throughout its operation.

Aarti Nanasaheb Kote, Ahanti Nandeshwar (2020), the cost was discussed. Mivan technology is compared to traditional construction methods. In comparison to conventional technology, Mivan's technology is excellent in terms of cost, quality, and time savings.

Mrs Ashwini Namdeo Baviskar, et. al. (2020), construction time in Mivan vs. conventional construction Mivan will be delayed 14 to 15 days on each floor due to the fact that traditional construction takes longer. Mivan construction costs are lower than normal construction, and Mivan technology can cut project time in half. As a result, the Mivan technology is deemed unsuitable for modest projects.

IV. OBEJCTIVES

- Quantity estimation of construction material required for building by both MIVAN formwork and Conventional formwork.
- To determine complete time required for completion of the building by both the above methods.
- To compare the cost of buildings based on the cost of materials required in each of them.
- To carry out the comparative analysis between the mentioned two methods of construction and define suitability difference between them.

V. METHODOLOGY

□ □Method of Cubic Contents

The rate per unit of the construction work is then multiplied with the total quantity of the work to get the amount required to do the particular work. In this precise method the length, width and the depth of the construction elements is multiplied to obtain the total quantity of that particular element. In the case of plastering of the surfaces and other surfacing works the complete surface area is found by multiplying the length with the width for which the work is to be done. Cubic Contents Method is particularly used to find the complete volume of the construction activities.

The cost of a construction facility is computed approximately as the total cubical

contents i.e. Volume of structure multiplied by the available Local Cubic Rate. This method is more often used for multistoreyed construction facilities. The total volume of building is obtained by Length multiplier by breadth and depth or height of the structure. It is more accurate than the other two methods viz., plinth area method and unit base method of computing.

□ □Aluminum Formwork System

It is a type of aluminium formwork that is used to create the aluminium solution is a quick, easy, versatile, and cost-effective option. Aluform is an advanced formwork method that allows for the efficient construction of a cast-in-place concrete facility. The system is so quick that it only takes 7 to 10 days to complete a slab cycle, it's easy to use, versatile, and cost-effective because the overall number of reuses is higher, around 150-200 under varied conditions. Single unified RCC load bearing building facilities can be constructed by continuously pouring the concrete inside the wall and slabs during the same construction activity. The Aluform formwork technology provides an excellent seismic resistant building facility with significantly higher efficiency and a noticeably smooth finish. As a result, each floor of the facility has consistent and beautiful concrete shapes and finishes.

VI. MATERIAL DETAILS

SL .NO	CONTENT	MIVAN	CONVENTIONAL
1	Concrete grade	M20,M25, M15	M15,M25,
2	Thicknes s of wall	140mm,160mm,180mm	160mm,200mm,230 mm
3	Steel	8mm,12mm,16mm,20mm	8mm,12m m,16mm,25mm,32m m
4	Slab	25	1500
5	No of Floors	G+1	G+1
6	Floor Area	250sqm	250sqm

VII. CONCLUSIVE REPORT

The task of housing due to the rising population of the country is becoming increasingly monumental. In terms of technical capabilities to

face this challenge, the potential is enormous; it only needs to be judiciously exploited.

Civil engineers not only build but also enhance the quality of life. Their creativity and technical skill help to plan, design, construct and operate the facilities essential to life. It is important

for civil engineers to gain and harness the potent and versatile construction tools. Traditionally, construction firms all over the world have been slow to adopt the innovation and changes. Contractors are a conservative lot. It is the need of time to analyze the depth of the problem and find effective solutions. MIVAN serves as a cost effective and efficient tool to solve the problems of the mega housing project all over the world.

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