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Comparative Studies of Construction Techniques (Conventional vs Mivan)

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Abstract - *Formwork, which holds and supports wet cement till such time it cures, is an exceptionally key component in concrete construction. With the globalization of Indian economy and presentation of multinationals in India for the development and countries pride program of golden quadrilateral, it has turned out to be chief to have fast development and opportune finishing of projects. Now a days current formwork system for superstructure development are ordinarily received. Formwork system influences on the cost, time, and nature of project delivery. Yet at the same time these formwork frameworks are very little utilized as a part of India and the majority of the temporary workers don't prefer to move to the most recent innovation as they have the uncertainty of confronting misfortunes in the undertaking and they are especially comfortable with the current formwork sort, the ordinary sort. Mivan is new development innovation up and coming for fruitful finish of mass lodging venture in India. In the meantime they trust that these formwork frameworks are bit costly. This paper means to look at benefits and faults by utilizing an ordinary timber formwork system and current formwork system like Mivan. The examinations incorporate costs, time, and nature of these frameworks. For better comprehension of this subject, diverse development destinations are contemplated where most propel methods in formwork are utilized and the information gathered from these locales is exhibited keeping in mind the end goal to give examination between present day Mivan formwork and conventional formwork framework.*

Key Words: **Formwork, Mivan, Conventional, Comparison, Requirement**

1. INTRODUCTION

This Indian development industry has begun utilizing a portion of the world class advancements. A few formwork systems are being used at better places on the planet; in the end the systems which are sensibly efficient and simple for operation with talented work are more valuable in India. Formwork system has critical part in the development procedure, settling on the correct choice by picking the suitable formwork system could prompt reaction to practical development. Distinctive systems have their own particular points of interest however one needs to pick a formwork which best backings singular task prerequisite. The progression of innovation, increment of populace and constrained spaces lead the best approach to develop the tall building structures. Developing the skyscraper was not a simple assignment at first but rather now with the assistance of the advanced innovation and machines it has turned out to be very simple.

Lack/non-accessibility skilled and semi-skilled workers brings about issues of cost and time over-runs, sub-par development, poor completions spillages, consumption of structures and so forth this can be escaped by receiving present day formwork frameworks. This additionally maintains a strategic distance from repairs and restoration of structures before its normal life expectancy.

2. CONVENTIONAL FORMWORK

This more often than not comprises of standard framed panels tied together over their backs with even individuals called waling. The waling is furnished with the essential capacity of opposing the flat power of wet concrete. One side of the wall formwork is first amassed guaranteeing that it is accurately adjusted, plumbed and strutted. The steel support confine is then set and situated before the opposite side of the formwork is raised and settled. Plywood sheet in mix with timber is the most well-known material utilized for wall formwork. The standard technique is to make up wall shapes as framed panels with the plywood confronting sheet screwed on to studs on a timber outline. This takes into consideration the plywood to be effortlessly evacuated and turned around and utilized on the two sides in order to build the quantity of reuses. The wall forms are powerless to edge and corner harm and should be precisely taken care of. Uncommon consideration must be given to comers and connected wharfs since the expanded weights connected by wet cement could make the projections open up, offering ascend to unsatisfactory grout escape and a poor complete to the cast divider. The cycle time for one floor with the use of conventional formwork is minimum 3-4 weeks. Also the block or Brick work and plastering is needed in order to get the finished surface. This takes more time and skilled labours too. This ultimately increases the time required for the completion of the project.

3. REQUIREMENT FOR MODERN FORMWORK SYSTEMS

The most punctual formwork systems made utilization of wooden scantlings and timber sprinters as it empowered simple shaping and making at site. Be that as it may, these wooden scantlings and timber sprinters have a tendency to lose their auxiliary and dimensional properties over a period time and after rehashed utilization consequently posturing security issues. A large number of the mischances happen in Reinforced Cement Concrete (RCC) development in light of sub-par formwork and scaffolding. Now center must be moved to other key factor "Formwork", to confront the difficulties for the consummation of quick track ventures. By going in for system formwork, considerable reserve funds are conceivable by quicker profit for speculations.

4. MIVAN TECHNOLOGY

MIVAN TECHNOLOGY is an aluminum formwork innovation. MIVAN framework is formwork development, cast – in – situ solid divider and floor chunks cast solid gives the auxiliary framework in one nonstop pour. Expansive room estimated shapes for dividers and floors sections are raised at site. These structures are made solid and durable, manufactured with exactness and simple to deal with. They bear the cost of expansive number of redundancies (around 250). The solid is created in RMC clumping plants under strict quality control and pass on it to site with travel blenders. Formwork frameworks for structures are delegated either flat or vertical formwork. Level formwork frameworks are those used to shape the flat solid work (pieces or rooftops), while vertical formwork frameworks are those used to frame the vertical supporting components of the structure, e.g., segments, center dividers, and shear dividers. Because of the fine resistances accomplished in the machined metal formwork parts, predictable solid shapes and complete are gotten floor after floor, a great many buildings, affirming to the most demanding gauges of value and precision. This enables plumbing and electrical fittings to be pre-assembled with the specific information that there will be a correct fit when gathered. The dimensional exactness at the cemented work likewise brings about reliable fittings of entryways and windows. The arrangement of Aluminum frames has been utilized broadly in the development of private units and mass lodging ventures. It is quick, basic, versatile and cost – compelling. It produces add up to quality work which requires least upkeep and when sturdiness is the prime thought. This framework is most reasonable for Indian condition as a tailor– made aluminum formwork for cast– in– situ completely solid structure.

4.1 Comparison of Mivan formwork system with Conventional Construction

Table -1

Factors	Conventional System	Mivan Formwork System
Speed of development	The speed of development is much slower because of well-ordered fruition of various phases of the exercises, for example, erection of formwork, cementing and de-covering and from there on putting and other completing exercises.	In this framework the divider and the floors are threw all the while in one nonstop operation and furthermore the completing work can be begun instantly, so the speed of the development is considerably speedier.
Quality	Because of traditional strategy for development ordinary quality is obtained.	Superior quality is acquired due to in-situ throwing of entire structure and transverse dividers done in constant operation.
Aesthetics	On account of ordinary development the partition walls are comprised of blocks because of which the column and the beam indicate unattractive projections in room interiors.	If there should arise an occurrence of Mivan framework the wall and the roof components are casted together because of which the insides have flawless and clean lines without unattractive projections in different corners. The wall and the roofs likewise have a smooth even surface.
External finishes	All the outer walls are comprised of blocks, so it requires manual bond putting which should be repainted as often as possible.	All the outside walls are comprised of concrete and don't require manual cement putting and furthermore have smooth completing, so this will require no regular repainting.
Maintenance	The maintenance cost is too high as it requires visit repairs of mortars of wall and roofs, painting of external and internal walls because of leakages.	The maintenance cost is negligible as the walls and roof is comprised of excellent concrete which don't require visit repairs.
Proficiency and cost saving	• Skilled workers are required on the site as the structure isn't solid and it ought to be in appropriate measurement. • The formwork boards are not light in weight.	• Less talented works are required on the site as all the completing things are pre-assembled. • The formwork boards are light in weight and can be lifted physically, so there is no need of burning through cash for substantial

		cranes for lifting. • There is no prerequisite of works for building block dividers and putting as real piece of the structure is thrown in concrete by little gathering of specialists.

4.2 The following are the limitations of using Mivan formwork System

1. Modifications are costly as all members are cast in RCC.
2. Concealed services become difficult due to small thickness of the components.
3. The aluminium formworks are far more expensive than the conventional formwork.
4. It requires uniform planning as well as uniform elevations to be cost effective.
5. The formwork can be cost effective only if it is used in symmetrical type of structure.

4.3 Comparison

Table -2

Sr. No.	Characteristics	MIVAN System	Conventional Formwork System
1	Speed of development	7 days cycle per floor.	Min. process duration is of 21 days.
2	Quality of surface finish	Excellent. Putting is not required	Bad. Putting is required
3	Pre-planning of formwork system	Required	Not required
4	Type of construction	Cast-in-situ Cellular construction	Simple RCC encircled development
5	Wastage of formwork material	Very less	In incredible sum.
6	Accuracy in construction	Accurate construction	Accuracy is Less than Modern Systems
7	Coordination between various offices	Essential	Not essentially required
8	Resistance to earthquake	Good resistance	Less than Modern Systems
9	Removing of floor piece frames without expelling props	Possible	Not possible
10	Need of any timber or plywood	Not required	These are the main components
11	Re-use estimation of formwork	150 – 200	Maximum 50
12	Stacking of materials	Hard	Easy
13	Initial investment in the system	High	Less
14	Economy in development	Economical for mass housing	Economical on small scale

3. CONCLUSIONS

It can be concluded that the modern methods of construction such as 'Mivan formwork system' are the key to meeting the demand for efficient, sustainable housing. Also the quality and speed must be given due consideration with regards to economy. Mivan formwork system not only helps in improving the quality and efficiency of the work but also has helped in maintaining the site safety. Traditional formwork for concrete construction normally consisted of bespoke solutions requiring skilled craftsmen. This type of formwork often had poor safety features and gave slow rates of construction on-site and huge levels of waste – inefficient and unsustainable. Modern formwork systems, which are mostly modular, designed for speed and efficiency. They are engineered to provide increased accuracy and minimize waste in construction and most have enhanced health and safety features built-in. By using MIVAN system we can achieve cost reduction in less time. By reducing cycle time than conventional method overall financial cost saving can be achieved.

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