Duration Comparison of Mivan Formwork over the Conventional Formwork

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Abstract **- The aluminum formwork system was developedby the Malaysian Company, which is why the alumin formwork technology is named after it.Mivan is coming up with new construction technology for the successful complet ion of a mass housing project in India.In this project, we discussed the cost Comparison of mivan technology with conve ntional construction technology. The technology of Mivan is absolutely fine with cost, quality and time saving as compare to conventional.**

Keywords: Aluminium formwork; Conventional formwork, Durability,Mivan technology.

I. INTRODUCTION

The Mivan Technology System was established by Mivan Company Ltd from Malaysia at the end of The 1990s as a framework for building mass loading ventures in the creation of nations. The units were to be mounted on cement, bearing the burden of the dividers using a formwork of aluminium panels. To be pointed out by the hundreds, the framework guaranteed a quick and prudent d evelopment technique.The solid surface finish delivered with aluminum frames enables the completion of a superb complete divider without the need for a wide layout. This is one of the frameworks distinguished to be particularly reasonable for Indian conditions for mass development, where quality and rate can be achieved.

II. FORMWORK

Formwork is the temporary structure that allows concrete to be shaped into the desired shape, holding it in the right p osition until it is sufficiently hardened. It also supports the load that has been imposed on it. The structural system of temporary supports that holds the formwork in position is termed as false work. It results in effective healing methods when formwork is left in place. The removal of formwork operation is known as stripping. It is possible to reuse stripped formwork. During construction, the failure of the formwork system causes loss of money and time, sometimes injuries and death. Formwork can be made from Timber, Plywood, Aluminium, Concrete Precast etc. Forms of steel and aluminium have an advantage over other types because they can be used repeatedly. Timber's disadvantage is that it can shrink, swell and shrink.

- **Requirement of good Formwork are:**

a. It should be strong enough to withstand all types of loads.

b. It should be rigidly constructed and efficiently propped.

c. Construction lines should be true.

d. It should be easily removable.

e. It should not get warped.

f. It should be easily available and suitable for reuse.

III. CONVENTIONAL FORMWORK

This formwork consists of standard framed panels tied together with horizontal members called wailing. The wailing resists the horizontal force of wet concrete. First, o ne side of the formwork is erected and properly aligned, plumbed and strutted.the other side formwork is erected aft er it has been placed.Using this formwork system, all the b uilding elements

Advantages of Conventional Formwork:

1. Easy to handle because of its light weight.
2. Easy to remove.
3. Damaged parts can be replaced with new one.
4. It is very flexible.
5. Easily available.

IV. MIVAN FORMWORK

- **Requirement of Mivan Formwork**

The Mivan formwork consists of an aluminium amalgam .While Construction is in the process, the formwork should bear, other than its own particular weight, the heaviness of the wet cement the live load due to work, and the effect on it by pouring cement and labourers. Vibration caused by vibrators used to lower the solid should also be taken into consideration.

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Therefore, the formwork design, taking into account its needs, is a fundamental part of the building's growth. The Mivan Formwork should have the capacity to take a live load, including an effect of around 370 kg / m2. It is that the formwork configuration, as it may be, is normal to work with a little calculation of well-being. The formwork surfaces should wear such a way, to the point that the surface remains level or as coveted by the ar chitect after diversion due to the weight of cement and fortification. The sheathing with a full live weight of 370 kg / m2 should not be redirected more than 0.25 cm and the sheathing with a live load of 200 kg / m2 should not be redirected more than 0.25 cm. maintaining the integ rity of the data. Mivan formwork's particular way will allow for easy alteration and evacuation of formwork and production could start quick with almost no variance in dimensional resistance.It should also be completely adaptable and can be changed easily in the format for any varieties.

- **Advantages of Mivan:**

a. High quality formwork ensures consistence of dimensions.
b. On removal of mould a high quality concrete finish is produced to accurate tolerances and verticality.
c. Total system forms the complete concrete structures.
d. Custom designed to suit project requirements.
e. Unsurpassed construction speed.
f. Panels can be reused up to 250 time
g. Can be erected using unskilled labour.

- **Advantages of Mivan formwork over conventional construction.**

a. More seismic resistance is achieved.
b. The durability of a complete concrete structure is more than conventional brick bat masonry.
c. Due to shear walls the walls are thin thus increasing carpet area.
d. Unsurpassed construction speed can be achieved due to light weight of forms.

Factors influencing selection of formwork system:

a. Adaptability & flexibility (fixable sizes)
b. Duration & repetition (lifespan)
c. Quality and surface finish
d. Availability
e. Time factor
f. Accessibility to work
g. Erection and dismantling(de shuttering)
h. Suitability of work for labours
i. Cost
j. Safety
k. Supply
l. Type of structure
m. Maximum load capacity
n. Weather condition
o. Skilled labour requirement

V. TYPES OF FORMWORK BASED ON STRUCTURAL MEMBER:

1. Wall Formwork

Wall formwork is used in dams, wing walls, basement rcc walls, etc. to concrete shear or RCC wall. Wall shuttering consisting of timbers that are attached to the inside of the p lywood sheeting
boards.The postboards are supported diagonally on both si des with the help of boards.

2. Beam Formwork

Beam is the RCC framed structure's most important memb er. The formwork of beams includes sheeting panels on the bottom and side sheets. On the size of the beam, the indivi dual parts of the formwork are prepared. A table for manuf acturing must be arranged on site for the prefabrication of t he sheeting.

3. Foundation Formwork

Foundation formworks are designed according to foundation type required on site. Shuttering design depends on foundation type like footing, combined footing, raft. Normally, there is a difference in the design for individual foundations, and shuttering for strip foundations. The design of shuttering is state by the size and height of the foundation.

4. Column Formwork

Column formwork arrangement may vary based on colum n outline such as rectangular, circular, and
hexagonal, or any other shape. Column shuttering sheeting is constructed according to the dimensions of the column. The panels are placed in a foot rim, with the help of bolts a nchored in the soil.

ESTIMATE OF TIME FOR ONE FLOOR OF AREA OF CONVENTIONAL FORMWORK:

ACTIVITY	NO OF DAYS
Column shuttering	12
Column steel-reinforcement	12
Buffer	12
Beam & slab shuttering	2
Beam & slab steel placing	15
Levelling	12
Concrete placing	3
Removal of formwork	6
Brickwork	15
Plastering	15
Finishing	15
TOTAL	167

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ESTIMATE OF TIME FOR ONE FLOOR OF AREA OF MIVAN FORMWORK:

ACTIVITY	NO OF DAYS
All Shuttering	18
Steel Reinforcement	18
Cancel electrification & plumbing	6
Alignment checking	3
Buffer time	2
Concrete placing	3
Removal of Vertical formwork	2
Removal of Other formwork	14
Lifting of wall panels	2
Gypsum plastering & painting etc	30
TOTAL	98

VI. CONCLUSION

Compared to the conventional method, construction costs with MIVAN formwork are rising by Approximately 25-30 percent.Construction cost per person. Sq.ft in MIVAN is as high as 33% compared to the conventional method.The per difference. Sq.ft construction cost increases by almost 392 Rs / Sq.ft in MIVAN. The duration of construction in MIVAN is less than the conventional method by Almost 25 per cent and 534 days, i.e. 1.5 years.

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