

## MIVAN TECHNOLOGY

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### ABSTRACT

The paper tries to give brief introduction to the readers, regarding the mivan technology, it is a precision-engineered formwork fabricated in Aluminium and how the uses of mivan, can save time and money for a multi-crore project.

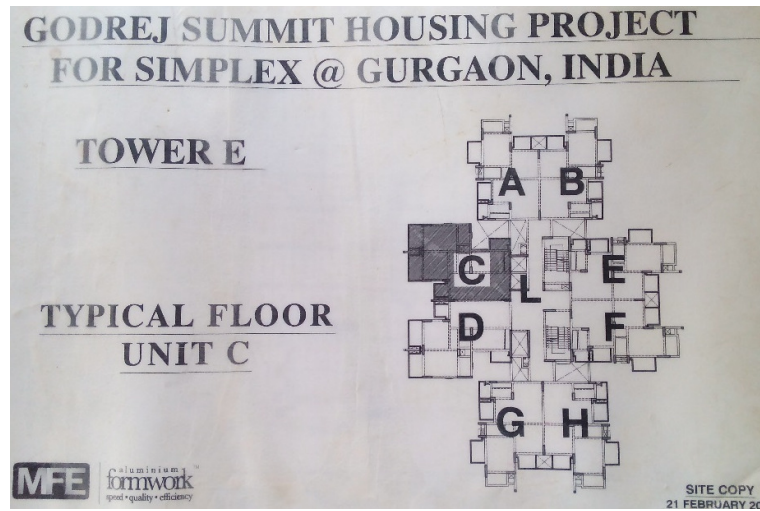
### INTRODUCTION

The most effective means available for the construction of high, medium and low rise mass housing R/C structures. It is a precision-engineered formwork fabricated in Aluminium. Monolithic pouring. Walls, columns, slabs & beam are poured together.

Speed - Induces a disciplined & systemized approach to construction, which creates a daily work cycle, the essence of the productivity. The productivity generates an overall work cycle, that can achieve 4/5 day per floor outputs or other cycle times to suit your project requirements. It is flexible in design and can form any architectural or structural configuration, such as stairs, bay windows, curved features, etc.

### WORKING OF MIVAN

**Step-1:-** Detail Drawing of Mock up Shuttering. Make sure the building architectural & structural details shall be freeze before manufacturing / fabrication of Aluminium Shuttering. It could be cumbersome while executing the works if there is any revision in drawing.



**Fig- 1 Showing the plan of tower-E building.**

**Step-2:-**After surveyor provides marking on columns then reinforcement of columns work start after that fixing of mivan shuttering on column is done.



**Fig- 2 Showing the fixing of mivan plate on column.**

**Step-3:-**Fixing of Slab Panels after erection of vertical wall panels then reinforcement of beams, slab and conducting work is done.



**Fig- 3 Showing the complete work of reinforcement of beam, slab, mivan shuttering of slab panels and conduiting works.**

**Step-4:-**We can start concreting work after slab shuttering & conduiting work is done.



**Fig- 4**Showing the concreting work of column, beams and slab.

## **FEATURES OF MIVAN FORMWORK**

### **Sheet Thickness & Panel Sizes**

- The concrete face of panels (Al Sheet) is 4 mm thick.
- Standard sizes of Panels are: 2000x600,2000x300,1200x300,850x300.
- Apart from above any size as required shall be manufactured and delivered.

## **Load Carrying Capacity**

- High load carrying capacity of 7-8 Tonnes Per square meter
- Weight
- Light weight is the main advantage over conventional formwork technology.
- Aluminium formwork weighs around 18-20 kg per meter square.

## **Cycle Time**

High speed of construction can be achieved by this system that means faster completion of project.

7 Days per floor.

## **Striking time**

- Vertical (Wall) Formwork – 12 hours after concreting or when concrete strength has reached 2N/mm<sup>2</sup>.
- Horizontal (Deck) Formwork – 36 hours after concreting or when concrete strength has reached 10N/mm<sup>2</sup>.

## **Pouring System**

Monolithic pouring for:

- Slabs
- Walls
- Columns
- Beams

## **Durability**

- The panels are made out of Structural Grade Aluminium alloy.
- Around 200 repetitions can be achieved while using Aluminium Formwork System.

## **CASE STUDY**

- CLIENT: Godrej Premium Builders Private Limited.
- PMC: Feedback Infrastructure Services Private Limited.
- Contractor: Simplex Infrastructure Services Private Limited.
- Design Consultant: RSP Design Consultants Private Limited.
- Total Area: 22.123 Acres.
- Built up Area: 25.55 Lac sq. ft.

## COST ANALYSIS

Here we considering Tower-E building and mivan cost as 150 USD per Sqm. without any taxes.

**Table 1. Table of shuttering quantity calculation.**

SR.NO.	SHUTTERING ITEMS.	UNIT	QTY	RATE IN USD	TOTAL RATE
1	COLUMN QTY	SQM	489.75	150.00	73461.77
2	SLAB QTY	SQM	487.08	150.00	73062.55
3	CHAJJAS QTY	SQM	125.01	150.00	18751.50
4	CHAJJAS WALL QTY	SQM	338.49	150.00	50773.14
5	BEAM BOTTOM QTY	SQM	108.54	150.00	16281.33
6	BEAM SIDES QTY	SQM	402.57	150.00	60385.11
	TOTAL QTY	SQM	1951.44	150.00	292715.40

Now 1 USD = 62.54 INR

So, 292715.40 USD = 18306421.10 INR that is the one time cost.

We can use approximately 200 repetition. So cost would be 91532.10 INR

## CONSTRUCTION PERIOD ANALYSIS FOR SHUTTERING WORK ONLY

For slab cycling that totally depend upon availability of workmanship for the shuttering work and we considering 18<sup>th</sup> floor only.

Here we are considering only one tower i.e. Tower-E

1st slab – 21 days

2<sup>nd</sup> slab – 18 days

3<sup>rd</sup> slab – 15 days

4<sup>th</sup> slab – 12 days

5<sup>th</sup> slab – 9 days

6<sup>th</sup> to 18<sup>th</sup> slab – 91days (@ 7 days per floor)

Total – 166 days = 6.38 months considering 26 working days per month.

## CONCLUSION

Concrete construction has gone through significant changes since the early 1990s and continues to develop innovation in formwork. Some of the pioneering companies in modern form working system are peri, doca system, outinord, meva, acrow.

We have tried to cover each and every aspect related to mivan shuttering formwork construction.

We thus infer that mivan formwork construction is able to provide high quality construction at unbelievable speed at reasonable cost. This mivan technology has great potential for application in India to provide affordable housing to its rising population.

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