

# Comparative Study of Tunnel, Aluminium and Conventional Formwork

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**Abstract:** Since India is the fastest growing major economy and rural to urban migration has been increasing which will led to increase in urabanisation and increase in demand for housing. In order to cater to this demand there has been vertical growth in the cities which have given rise to construction of muti-storied buildings and formwork plays important role in construction of framed or monolithic buildings. The study and research consist of different types of formwork which are being used in construction industry. This study compares the tunnel and aluminium formwork with conventional formwork and how it has advantages over conventional formwork. This study shows how each formwork are different from each other and can be beneficial for different types of constructions.

**Keywords –** Advantages, Aluminium/Mivan Formwork, Case Study, Comparison, Limitations, Tunnel Formwork.

## I. INTRODUCTION

The formwork shuttering and deshuttering time is very crucial for determine the slab cycle and completion time of the project Tunnel formwork and aluminium formwork technology has been developed to speed up the construction process of the building ensuring economy and quality. In tunnel formwork the thickness of the wall and slab is less as compared to conventional method. The moulds or form are given provision for electrical, plumbing fitting or for any duct thereby it reduces the time required for cutting, grooving and shaping each wall for electrical provisions

The tunnel and aluminium formwork are monolithic type of construction since the slab, beam, walls and columns are casted in single pour. Hence, it is also called as monolithic type of construction. Aluminium formwork is also called as Mivan Formwork.

The initial cost of tunnel and aluminium formwork is high as compared to conventional formwork. Tunnel formwork is heavily dependent on crane and is only feasible for use in muti storey building of more than 4 floors and having multiple buidings at same site.

## II. ADVANTAGES OF TUNNEL FORMWORK

1. Tunnel formwork has very much higher repetitions than conventional as well as aluminium formwork. About 200% more repetitions than aluminium formwork and 5000% more repetitions than conventional timber and plywood formwork
2. Tunnel formwork has much higher strength, higher durability and higher water resistance than conventional plywood formwork

3. Tunnel formwork increases the usable carpet area of the flat as it does not have beams and columns like in conventional frame structure
4. It provides smooth finishing and it does not require plastering.
5. Since masonry work is reduced or eliminated, it helps in saving the time required for masonry work and completing the interior and finishing work at a faster pace.
6. The slab cycle time of tunnel formwork is around 2 days which is more than 1000% lesser than conventional formwork whose slab cycle is around. 25 days

## III. LIMITATIONS OF TUNNEL FORMWORK

1. It is heavily crane dependent
2. It's initial cost is very high
3. There is no scope for change in design during execution work
4. Basement construction cannot be done
5. It is not economical for small and medium rise buildings
6. It is also not economical where repetitions are less

## IV. Advantages of Aluminium Formwork

1. Aluminium formwork is lighter in weight as compared to tunnel formwork
2. It has high resistant to corrosion
3. It has 2500% more repetitions than conventional ply formwork
4. It is also eco-friendly as it does not uses ply or wood and it can also be recycled

5. Its slab cycle time is minimum 4 days in ideal condition but it can go upto 8-10 days which is around 250-350% more than conventional formwork
6. Like tunnel formwork it also offers smooth finish and doesn't require plastering

### V. Limitations of Aluminium Formwork

1. It requires more lead time than conventional formwork as it takes time for fabrication work as per drawings
2. Due to wall ties there will be more number of holes after casting which needed to be grouted
3. It contains many components which needed to be handled and kept carefully

4. It also needs skilled labour and strict supervision as it will be difficult to make changes to walls after casting

### VI. Case Study

Name of organization	VTP Group
Name of Project	VTP Purvanchal
Location	Wagholi, Pune
Type of Project	Residential Project
Project area	11 acres`
Type of Formwork	Conventional, Tunnel and Aluminium Formwork

### VII. Site Images:



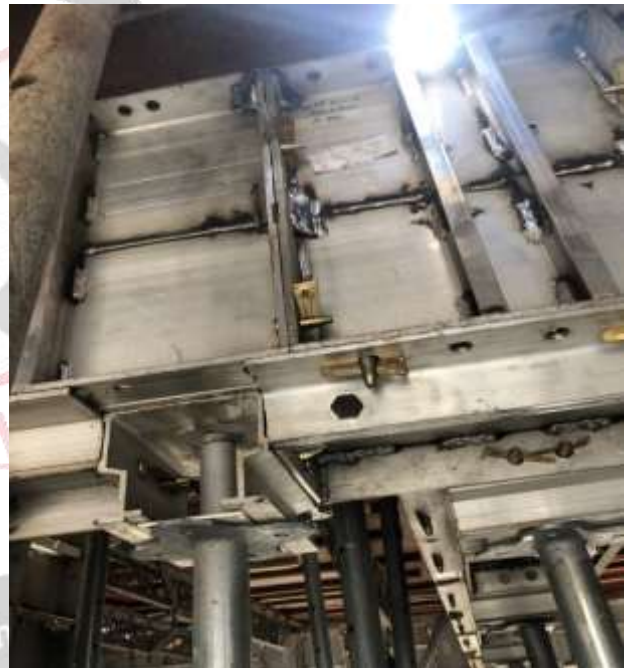
### VIII. NEW CONSTRUCTION METHODOLOGIES LIKE TUNNEL AND ALUMINIUM FORMWORK TECHNOLOGY WERE USED:

1. TUNNEL FORMWORK:





2. ALUMINIUM FORMWORK:





### IX. Conclusion

The demands of the real estate industry to complete the project with good quality, low cost and short time can be met by using the monolithic construction technology like tunnel and aluminium formwork. The initial cost of such construction methods are higher but it can be beneficial for large projects having multiple floors and multiple towers having similar floor plans.

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