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Comparative analysis for high rise building of tunnel formwork system and aluminum formwork system

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Abstract - *Now a days, low waste formwork systems for construction are being used. The large sized columns in buildings are now being replaced by small thickness shear/RCC Walls. So it gives a large carpet area and removal of offsets in the building also the quality of construction is getting upgraded. Formwork is a temporary structure which supports fresh concrete till it becomes strong enough to sustain its own weight. After setting of concrete, the formwork is removed and a solid structure of required shape and size is produced. This is the very important element in the construction of building. For many years, in the field of construction, use of conventional i.e. wooden formwork was a regular practice. Now the scenario of construction field is much different, but the study is needed in order to choose the suitable Formwork with different perspectives. Cost, time is the basic parameters but along with that we should also focus on quality, safety and construction waste generation during the process*

***Key Words*: Shear wall, Formwork, RCC wall.**

1. INTRODUCTION

Formwork systems are key factors in determining the success of a building construction project in terms of cost, speed, quality and safety of work. Selecting poor quality of formwork systems in aiming to minimize the cost of project will directly affect the speed and quality of construction. The formwork selection for high rise building is depending upon the cost, time and finishing quality. For mega construction projects, implementation of optimized formwork system brings effectiveness in the work and yields superior results. There are different types of formworks are used now days in Indian construction industry. The formwork are made up of wooden, steel, aluminum or prefabricated forms For repetitive work in high rise building construction tunnel formwork system and aluminum formwork system is developed.

1.1 Tunnel formwork system

Tunnel form is a formwork system that allows the contractor to cast walls and slabs in one operation on a daily cycle. It combines the speed, quality and accuracy with the flexibility and economy of in-situ construction. Construction durations are reduced significantly by this rapid system when compared to conventional methods. Tunnel Form System brings speed, quality and accuracy to concrete construction and provides big savings in finishing and M&E works. Hi-tech technologies for steel formwork production make tunnel forms strong & durable. The system creates efficient load-bearing structures which are known as the most earthquake resistant structures.

1.2 Aluminum formwork system

Aluminum formwork, being a new type of building material was invented in the 1962. After more than 50 years of development, it has been widely used in the United States, Canada, Europe, HK, Macao, India, Malaysia, South Korea, Brazil and Vietnam. However, the application of aluminum formwork is relatively new in our country. Alumnus alloy formwork has many advantages as compared to other formworks. It can be used repeatedly with low average use-cost: Aluminum alloy formwork system adopts the integral extrusion forming as raw materials (6061-T6). With a normative construction, a set of formwork can be used more than 300 times in a low average use-cost.

2. Objective

The high rises building construction consists of number of repetitive activities and also has same identical floors. The increase in duration of construction greatly affects the construction cost. Selection of best formwork system gives best result in cost saving. Formwork consists of 20-25% of total cost of project. So that used advanced formwork system helps in cost saving as reduction slab cycle time. This study is done for comparative analysis of tunnel formwork system and aluminum formwork used for high rise building construction.

3. Process

For the right type of building site and structure this is a very rapid form of construction. It gives high quality surface finishes. The used this formwork results in a high dimensional accuracy of the finished structure requires a smaller but multi-skilled worker team on site. The planning of construction activities is easy due to the repetitive activity of the work.

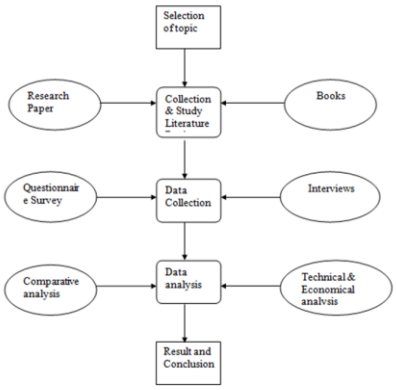

Chart -1: Flow chart of construction process.

4. Data Collection

The primary and secondary data was collected through the field visit. From interviews with project manager, site engineers the detailed process of tunnel formwork system and aluminum formwork system was studied.

Sr.No	Details	Case Study 1
1	Name of Project	RohanAbhilasha,wagholi
2	Type of Project	Residential
3	Type of Formwork System Used	Tunnel Formwork System
4	Consultant	MESA Imalat,Turkey Hi TEK insat,Turkey
5	No of Floors	2parking + 12Floors
6	Height of Building	42m include
7	Total slab Area	13568 m2
8	Total Formwork Area	37114 m2

Fig -1: Site details

Sr.No	Details	Case Study 2
1	Name of Project	Panchshil Highrise,wagholi
2	Type of Project	Residential
3	Type of Formwork System Used	Aluminum Formwork System
4	Consultant	Tricon Infra Buildtech pvt .Ltd
5	No of Floors	3parking + 32Floors
6	Height of Building	106m
7	Total slab Area	975.83 m2 on each floor

Fig -2: Site details

5. CONCLUSION

Formwork systems are key factors in determining the success of a building construction project in terms of cost, speed, quality and safety of work. Selecting poor quality of formwork systems in aiming to minimize the cost of project will directly affect the speed and quality of construction. The formwork selection for high rise building is depending upon the cost, time and finishing quality. So Selection of right building formwork will be helpful in minimizing construction cost.

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