STUDY ON FEASIBILITY OF MVAN FORMWORK TECHNOLOGY FOR CONSTRUCTION PROJECT IN VIDARBHA REGION.

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ABSTRACT

Formwork enables to cast and construct the important elements and components of any construction project, which are required to be strong and effectively handle the structure. Mivan is comparatively a new construction technology upcoming for successful completion of mass project especially repetitive in nature. The Mivan Formwork system is appreciably efficient with cost, quality and time saving as compare to Conventional Formwork system. The basic ideology is to bring the attention on mivan Formwork system over conventional formwork system and highlighting the affectivity of mivan formwork system over Conventional formwork system the main aim of this project is to determine which type of formwork is suitable for type of construction and which have less effect in project duration and cost for vidrabha region.

Keywords— Time, cost, safety, conventional formwork, mivan formwork

1. INTRODUCTION

Any innovation has a valid reason for its emergence. Likewise, the Real Estate sector is also subjected to gradual changes to meet the requirements. At present; the demand for housing and commercial spaces is at an increased rate. The lucrative jobs along with home loan facilities have created the affordability to own a house for the middle-class group. So, owning a property is no more a big challenge. But these factors have increased the real estate activities. Developers are also finding ways to accomplish the best service. As a result, the construction activities are progressing on a larger scale or mass production is in vogue. In such cases, the primitive or the traditional methods of construction has to be relooked. Hence, Mivan construction technology is adopted by major developers to combat high
The reliost formwork system made use of wooden scantling and timber runners as it enabled easy forming and making at site. But these wooden scantling and timber runners tend to lose their structural and dimensional properties over period time and after repeated usages thus posing safety problems. Many of the accidents take place in reinforced cement concrete construction because of interior formwork and scaffolding. New focus has to be shifted to other key factor formwork to face the challenges and to save the time of construction for the completion of fast track projects. By going in for system formwork, substantial saving is possible by faster return on investment.

Another key factor for adopting is the cost factor for mivan shuttering components, labour & material cost better than the traditional or conventional methods.

2. OBJECTIVE OF STUDY

To find out the conventional formwork & aluminum formwork feasibility on the basis of Cost, Time, quality, quantity parameters.

3.1 MIVAN FORMWORK

Mivan technology is an aluminum formwork system. Mivan framework is formwork development, in which no. panels are assembled in boxed type manner where cast in situ solid divide by aluminum panels and floor chunks cast solid gives the auxiliary framework in one nonstop pour by using ready mixed concrete. No. of floors are cast in one time by using panels. These structures are made solid and durable, manufactured with exactness and simple to deal with formwork. This formwork allows (around 250) repetitions. The solid is created in RMC clumping plants under strict quality control and pass on it to site with travel blenders. Mivan technology is one of the most commonly used advanced technologies all over the world. The use of traditional conventional formwork for mass building construction was appearing to be very difficult task with increase in cost, time, labor requirement etc. For a quick and good quality durable structure in cost effective way, mivan technology was used for mass construction projects. In India, the system with reasonably economical and easy for operation with skilled labor. It is suitable where adapted. Mivan technology produces good quality structural work with maximum durability with less maintenance required. It is continuous casting of column slab and wall in one pour process of concrete. All the components of formwork which makes it light in weight and also more number of times repetitions can be possible. As they are of light in weight dismantling can be done with ease and is simple, in other words it is short and simple cycle. This technology includes basically 7 days simple cycle along with dismantling operations. 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. It is therefore obligatory to work out a method or scheme for systematic approach, for which mivan Formwork will really help.

4. COMPONENTS OF MIVAN FORMWORK

Components of mivan technology are as follows:

4.1 Beam components

1. Beam side panel According to the size of the beam the cutting is done to form a rectangular structure. 2. Prop head for soffit beam For easy dislodging of the formwork V-shaped head is used. 3. Beam soffit panel It support the soffit beam and is a plain rectangular structure of aluminum. 4. Beam soffit bulk head It is used to carry the bulk loads.

4.2 Wall components

1. Wall panel An aluminum sheet which forms the face of the wall is carefully and properly cut to fit the size of the wall. 2. Rocker It is of L-shape and also a supporting component of wall. 3. Kicker It act as a ledge to support and at the top of the panel it forms the wall face. 4. Stub pin It helps in joining of two wall panel together.

4.3 Deck components

1. Deck panel It forms a horizontal surface for safety of workers and for casting of slab. 2. Deck prop It is a supporting component of deck and also it bears all the loads coming on deck. It is prop head with V-shaped form. 3. Prop length It is a length of the prop and it depends on the slab length. 4. Deck mid It helps in supporting and to hold the concrete in the middle portion pf the beam. 5. Soffit length It support the edges of the deck panel.

5. METHODOLOGY

5.1 Data Collection

Data collection includes primary data and secondary data for the preparation of questionnaire survey. It includes literature survey, observation methods, telephonic interactions and interviews.

5.2 Data Analysis and Comparison

Data collected is analyzed whether it satisfies the requirement of the research of the project. Data should be relevant to the project work in order to get necessary inputs. This case study was conducted on a residential flat scheme which was using mivan technology. The quantity of columns, beams and slabs have been calculated using excel sheet, the total quantity of columns, slabs and beams are collected and table is prepared to do comparison between the
conventional and mivan formwork. The rates of mivan technology is taken and applied from the mivan manufacturing company. The table is prepared to compare cost of conventional formwork and mivan technology. With the help of Microsoft project software the duration is calculated.

Case study I)

Project Name: - Pushp Shri Apartment, Project: - Residential building, Company Name: Yasha: shri Engineers and contractors, Location: - Amravati Built up area: - 434.55 sq., Number of storey: - G+5 floors

Case study II)

Project Name: - Yash: shri Row Houses, Project: - Residential building, Company Name: Yasha: shri Engineers and contractors, Location: - Amravati, Built up area: - 150 sq.m,Number of storey: - 20 No. Row Houses.

6. RESULT

1. Using the mivan technology for the Pushp Shri Apartment the total duration required of finishing G+5 storey building is 258 days and using conventional techniques the total duration required for complication of G+5 storey building is 486 days (Table 5.3). So the total time saving is 228 days. The total cost of Mivan shuttering G+5 storey building is Rs. 15741579.8 and by using conventional techniques the total total shuttering cost of G+5 storey building is Rs.267192 (Table 5.1). So the total cost difference in shuttering is Rs.15474387.8 and rate of shuttering per square meter is 1500 when the repetition of shuttering is only 5 times.

1. Cost Comparison
2. Time comparison

![Time Comparison of Pushp Shri Apartment](image)

Graph: Time Comparison of Pushp Shri Apartment

2. At the same time for comparison we have shown case study for Yash: shri row house where 20 row house considered for construction. The total duration required for completion of 20 row house building is 930 days. The total cost of mivan shuttering for 20 row houses building is 33,42,225Rs. and by using conventional techniques the total shuttering cost of row house building is Rs 3,20,024. so the total cost difference in shuttering is Rs. 30,22,201Rs and rate of mivan shuttering per square meter is 375 Rs. when repetitions of shuttering is only 20 times.

1. Cost Comparison

![Cost Comparison of Shuttering of Yash:shri Row Houses](image)

Graph: Cost Comparison of shuttering of Yash:shri Row Houses
2. Time Comparison

![Time Comparison of Yash:shri Row Houses](image)

Graph : Time Comparison of Yash:shri Apartment

7. CONCLUSION

It is concluded that construction facilities built by using the mivan formwork technology is quite cheaper than the Conventional Method and total cost saving is nearly about 12.5 percent. This technology also enables us in saving considerable amount of time in construction of high rise building. When the repetition of formwork is there on site then it is more convenient for saving cost and time. Also, many of the finishing works is saved in using Mivan technology which includes plastering (both internal and external), brickwork etc. Monolithic casting of the structural members at one pour saves appreciable time and increases strength and durability of the structure. The advantages of mivan technology include higher durability of material, uniform quality of construction, low maintenance of formwork system and faster completion of activities. Whereas the drawbacks are high initial cost, structural symmetry is required and requirement of skilled labor at every stage of construction. Yes, for vidarbha region mivan technology is preferable when no. of reputation of formwork is high or greater than 20. Yes, there is lack of awareness in Vidarbha region about mivan technology. If mivan shuttering suppliers provide any session on this technology to contractors and developers it will be beneficial for contractors and mivan suppliers also. Yes, there is an issue found about availability of mivan shuttering material in nearby area. If requirements increase then industrial production is also preferred for Vidarbha region.
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