Study of Mivan Technology Using Line of Balance Method

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Abstract- *Construction is one of the significant sectors of Indian economy and is an integral part of the development. Today India's urban population is the second largest in the world and its future development leads to increased demand for housing to cope with this problem India should desperately need to plan for acquisition of land and rapid creation of dwelling units. Construction is a complex process involving basically the areas of Architectural planning, Engineering & Construction. There is growing realization today that speed of construction needs to be given greater importance especially for large housing projects. This is not only essential for the faster turnover of equipment and investment – leading possible to the reduction in the housing cost but also for achieving the national objective of creating a large stock to overcome shortest possible time. Fortunately, some of the advanced technologies catering to faster speed of construction are already available in the country. For e.g. Prefabrication, autoclaved blocks, tunnel formwork, aluminum formwork (MIVAN Technology) of construction etc. This paper describes the comparative analysis of conventional formwork and tailor made formwork on the basis of cost and time parameter.*

Keywords- Mivan, Aluminium formwork.

I. INTRODUCTION

The Mivan Technology System was created by Mivan Company Ltd from Malaysia late 1990s as a framework for building mass lodging venture in creating nations. The units were to be of thrown set up cement, with burden bearing dividers utilizing a formwork of aluminum boards. To beraised by the hundreds, of a tedious outline, the framework guaranteed a quick and prudent technique for development. The solid surface completion delivered with the aluminum frames permits accomplishment of a superb divider complete without the requirement for broad putting. This is one of the frameworks distinguished to be especially reasonable for Indian conditions for mass development, where quality andrate can be accomplished at abnormal state.

II. MIVAN SYSTEM

MIVAN System

It is the most advanced formwork systems. It is fast, simple and adaptable. It produces total quality work which requires minimum maintenance and when durability is the prime consideration. It is a totally pre- engineered system where in the complete methodology is planned to the finest details. In this system the walls, columns and slab are casted in one continuous pour on concrete. Early removal of forms can be achieved by the air curing/ curing compounds. These forms are made strong and sturdy, fabricated with accuracy and easy to handle. The components are made out of aluminum and hence are very light weight. They afford large number of repetitions (around 250). The re-propping is simple hence short cycle time can be achieved.

ADVANATGES OF MIVAN FORWORK

Uniformity in all components of structures, Casting of all structural member is done at single pour of concrete. Scrap value is high., Can be erected using unskilled labours and without the removing of props, deck panel can be removed, More seismic resistance - For the structural member the box type construction provides more seismic resistance., Durability of concrete structure is more., Due to minimum number of joints, leakage of concrete is reduce and durability is enhanced., The carpet area is high due to thin shear wall., Finishing is smooth of slab and wall, hence eliminates the plastering work., Uniform quality of construction and uniform grade of concrete., No further maintenance required due to strong built concrete., Lesser labour required., As a better sound transmission co-efficient.

III. LINE OF BALANCE TECHNIQUE

Line of balance (LOB) is a management control process used in construction where the project contains blocks of repetitive work activities, such as roads, pipelines, tunnels, railways and high-rise buildings, precast construction, row houses etc.. It is a control process for collecting facts relating to time, cost and schedule accomplishment, all the project related task is measured against specific plan. LOB shows the process, status of project, crew size continuity, and background of work, time and phase of project activities providing management with measuring tools. LOB assists project management by comparing a formal objective against actual progress, examining only the deviations from established plans, and gauging their degree of severity with

respect to the remainder of the project, dealing with problem and trouble causing areas and problem solving within specific constrains.

1 Forecasting future performance.
2 A programmed rate of completed units is met.
3 A constant rate of repetitive work is maintained.
4 Labour and plant move through the project in continuous manner such that a balanced labour force is maintained and keep fully employed.
5 The cost benefits of repetitive working are achieved.

IV. METHODOLOGY

Steps involved in methodology

STEP 1: SELECTION OF TOPIC.
Step 2: study of literature is available in the form of books, journals to get proper understanding of the issue.
Step 3: list out various books required for reference and related topic, collect literatures and carry out clear methodology.
Step 4: making a list of companies to approach.
Step 5: identification of different system of formworks used in high-rise building.
Step 6: identification of factors influencing the selection of formworks from literature review and experts.
Step 7: interviews with experts, contractors, for identifying the factors influencing the selection, advantages, limitations and problems faced at site.
Step 8: case study analysis of the ongoing high-rise building.
Step 9: analyzing formworks cost, duration and quality.

DATA COLLECTION

In high-rise residential building, number of activities is carried out like brickwork, plastering, plumbing, electrification, etc. on each unit, and same activities are repeated from one floor to another. For drawing LOB graphs, such repetitive activities and duration of each activity was collected. Also, to draw the histogram and to calculate activity progress rate, EFR and IFR, number of labours associated for each activity was collected in detail from the respective site

DRAWING LOB DAIGRAM

Once the data have arranged in tabular form like activity symbol, planned and actual duration, number of labours, the next step is to draw the LOB graphs for all the repetitive activities with planned duration and actual duration for all the floors. The graphs were drawn by taking duration in days on X- axis and number of floors on Y-axis, and the total duration required for all the repetitive activities was known from the same graph. These graphs are drawn by giving buffer before starts each activity because, when construction activities progress continuously in a chain, some spacing between activities is required. This spacing serves as a buffer and may be a required stage or time interval, which usually referred to as stage and time buffers. When rate of production is more, buffer is to be provided at top, and when the rate of production is less, buffer is to be provided at bottom.

V. 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.

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

Step-2:-Wall shuttering preparation as per drawing
Step-3:-placing of beam soffit with the help of props.
Step-4:-Preparation of deck slab
Step-5:-placing of beam soffit with the help of props.
Step-6:-Start concreting at one time.

VI. CONCLUSION

- 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.
- After study of mivan technology, the control scheduling technique called line of balance is studied from literature review it is effective than CPM for repetitive works

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