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Literature study on comparision between mivan formwork and conventional formwork in construction

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ABSTRACT

Due to rapid development in infrastructure it turns out to bevery necessary to find and adopt some eco-friendly products. It is becoming more and more obvious that gradual evolution in the field of construction has adverse effect on the well-being the earth and putting future generations in danger. Concrete could also be used for a few special purpose that special properties are more important than those commonly considered. The most important objective of this study is to assess the chances of usage of GGBS (Ground Granulated Blast Furnace Slag) in concrete. The enhance mentina technology requires studying effects caused by the mineral admixture on the strength of the cementitious materials. This project represents the results of an experimental investigations accomplish to understand the suitability of GGBS in production of concrete. In this experimental study the impact of GGBS on strength of referral concrete M20 was prepared using 43 Grade OPC and the other mixes were prepared by replacing part of OPC with GGBSThe replacement levels were 0%, 20%, 30% & 40% (by weight of cement) for GGBS and replacing fine aggregate with 0%, 20%, 30% & 40% crusher dust.

Key words: Mivan formwork, Conventional formwork

INTRODUCTION

"Mivan formwork is the advanced formwork system made of strong and sturdy aluminum components that has great strength, durability, simple to install, adaptable and is used in the construction of residential units and mass housing projects".

Pre-cast and cast-in-situ are techniques that are used for quick construction. Pre-cast includes the wall-panel units directly added to building structure. The use of aluminum also evolved as one of the technique for quick formwork may be up to 25% of the structure in building work, and even higher in bridges, it is thus essential that the forms are properly designed to effect economy without sacrificing strength and efficiency. Certain patented systems based on imported technologies such as "Mivan system" (Malaysia) have come on the Indian scene in recent years.

Several systems are adopted at different places in the world; eventually the systems which are reasonably economical and easy for operation with skilled labor are useful in India. Certain systems are in vogue and more and more contractors are trying to bring in new technologies. These are essentially based on the basis of mode of construction, namely, pre-cast construction or in-situ construction.

FORMWORK

When concrete is placed, it is in plastic state. It requires to be supported by temporary supports and castings of desired shape till it becomes sufficiently strong to support its own weight. This temporary casing is known as the Formworkor forms or shuttering. The term mouldsis sometimes used to indicate formwork of relatively small units such as lintels, cornices etc.

DEFINITION OFFORMWORK

"Forms or moulds or shutters are the receptacles in which concrete is placed, so that it will have desired shape or outline when hardened. Once concrete develops the adequate strength to support its own weight they can be taken out".

"Form work is the term given to either temporary or permanent moulds into which concrete or similar materials are poured".

ECONOMY OF FORMWORK

• The plan of the building should imply minimum number of variations in the size of rooms, floor area etc. so as to permit reuse of the formwork repeatedly.

• Design should be perfect to use slender sections only in a most economical way.

• Minimum sawing and cutting of wooden pieces should be made to enable reuse of the material a number of times. The quantity of surface finish depends on the quality of the formwork.

Mivan construction is economical when it is a large construction when used of bricks is totally eliminated and all the components, that is beam, wall, staircase, etc, made of concrete.

LITERATURE REVIEW

"Impact of Mivan Formwork over Conventional Formwork"

This paper describes in brief the need of Mivan formwork in the Indian construction industry. Construction is one of the significant sectors of Indian economy and is an integral part of the development. With the globalization of Indian economy and introduction of multinationals in India for the construction and nations pride program of golden quadrilateral, it has become foremost to have speedy construction and timely completion of projects. Now days, low waste modern formwork systems for superstructure construction are commonly adopted. Formwork system affects on the cost, time, and quality of project delivery. But still these formwork systems are not much used in India and most of the contractors do not like to shift to the latest technology as they have the doubt of facing losses in the project and they are very much familiar with the existing formwork type, the conventional type. At the same time, they believe that these formwork systems are bit expensive. This study is based on the survey conducted on a construction site namely Jaypee Krescent Homes at sec 134 Noida UP. This paper describes the comparative analysis of conventional formwork and tailor made (MIVAN) formwork on the basis of cost, quality time and strength parameters.

1) Emerging Trends in Formwork - Cost Analysis & Effectiveness of Mivan Formwork over the Conventional Formwork-By Miss. Patil Dhanashri Suryakant, Prof. Desai D B.

This is the case study of Godrej garden enclave which is constructed by using MIVAN technology by construction division of Godrej and Boyce Mfg. Co. Ltd Vikhroli, Mumbai. This paper is based on detailed cost saving analysis for Mivan formwork over the wooden (conventional) formwork. It has also given the details of components of Mivan formwork.

2) Comparative study of formwork in building construction- by Dr. M. N. Bajad, Pawan S. Khandelwal, Avihv Vyavhare.

This paper is comparative study and case study of Sayantara residential building in Ahmednagar. This building is based on conventional formwork construction. This study is based on parameters like concrete, steel, wall, formwork, labor etc. India, being the second largest urban populated nation in the world, there is an increase in demand for housing in India. Thus high rise buildings are gaining popularity. Aluminum formwork system is successfully used in Japan, Singapore, and Malaysia and Middle East countries. It has significant advantages over conventional techniques such as speed, strength and cost saving on mass construction.

3) Cost Effective House by Using Various Construction Techniques and Materials by Prof. U. J. Phata, Prof. C. S. Chavan, Lalit V. Rathod, Vishwas L. Nachare, Atul, B. Suryawanshi.

It is a comparison of different construction techniques used for low cost housing. The compared techniques are 1. Rat-trap bond technology, 2. Filler slab technology, 3. Aluform technology (Mivan technology), 4. Gypsum area separation wall. The study is based on literature survey and field survey.

4) Mivan Technology by Mr. Shankar Bimal Banerjee, Mr. Pawan Dilip Barhate, Mr. Vipul Pradip Jaiswal.

This paper tries to give brief introduction to the readers, regarding the mivan technology, it is a precisionengineered formwork fabricated in Aluminum and how the uses of mivan, can save time and money for a multicore project.

5) Comparative Studies of Construction Techniques (Conventional Technique Vs. Aluminum Formwork Techniques)- By Umang Patel, Bhupendra M Marvadi, Ninjal M. Parekh.

The paper discusses the importance and scope of recent trends in construction techniques. The paper emphasizes on exploitation differing kinds of materials in modern trends and for effectiveness in infrastructure building for fast economic process and development of a nation exploitation recent advancements within the field of construction technology. Nowadays, the prefabrication and aluminum formwork technique in trade construction industry is developed countries has improved the standard of the construction industry. Aluminum Formwork System is a construction system for forming cast in situ concrete structure of a building. Classified information's given for Aluminum Formwork technique and Conventional techniques. Two case studies are taken for the analysis of the construction techniques. The concept of formed (also called "prefabricated") construction includes those buildings wherever the bulk of structural parts are standardized and created in plants during a location far from the building, so transported to the location for assembly.

Uses of Mivan formwork

- Easy to operate within less time
- Includes the 3S scheme of construction to give strength, safety, and speed.
- Slabs and walls are easily formed in one consistent development.
- Assembling and fitting the part of shuttering.
- Beam construction and column are removed.
- Construction of slabs and walls in a simultaneous way.

Future scope of Mivan technology

• Mivan technology uses aluminum formworks to make the buildings stronger and durable. Mivan shuttering isemerging as a major technology in the residential and high-rise building construction in India, as it helps reduce time taken for construction, reduces dependence on labor and reduces cost of the final buildings.

• The thesis work is restricted to only Mivan formwork and no other type of aluminum formwork. The future researchers can continue by working over other type of formworks construction by analyzing activities like brickwork, plastering, painting, and many more. Furthermore, interviews of different people from construction industry can be taken based on question prepared and analysis can be done.

COMPARISON OF MIVAN FORMWORK SYSTEM WITH CONVENTIONAL CONSTRUCTION

The below shows the relative comparison between the Mivan form work system and the conventional system. The comparison is made on the factors such as speed of construction, quality of construction, aesthetics, external finishes and maintenance.

Speed of Construction

The speed of construction is much slower due to step by step completion of different stages of the activities such as erection of formwork, concreting and shuttering and thereafter plastering and other finishing activities. In this system the wall and the floors are casted simultaneously in one continuous operation and also the finishing work can be started immediately, so the speed of the construction is much faster.

Quality

Due to conventional method of construction normal quality is obtained. Superior quality is obtained due to in- situ casting of whole structure and transverse walls done in continuousoperation.

Aesthetics

In the case of conventional construction, the partition walls are made up of bricks due to which the column and the beam show unsightly projections in room interiors. In case of Mivan system the partition wall and the ceiling elements are

casted together due to which the interiors have neat and clean lines without unsightly projections in various corners. The wall and the ceilings also have a smooth even surface.

External Finishes

All the external walls are made up of bricks, so it requires manual cement plastering which needs to be repainted frequently.

All the external walls are made up of concrete and do not require manual cement plastering and also have smooth finishing, so this will need no frequent repainting

Advantage of Mivan Formwork

- Mivan formwork is light in weight so, it can be handled easily
- Provides a natural aesthetics as the surfaces formed are smooth. Further, no requirement of plastering.
- More resistant to seismic forces
- Rapid pace/ High construction speed due to which whole construction is completed in less duration, making this technique economically sound by reducing indirect costs of project
- Lower maintenance required as the number of joints is less
- Efficient in terms of plinth area usage Formwork panel can be used as much as 200 times
- Aluminum does not have corrosion problem such as steel
- Less fabrication cost and correspondingly less debris generation.

CONCLUSION

[1] It can be concluded that the modern method of construction such as, Mivan form work system “are the key to meeting the Demand for efficient, sustainable housing. Also the quality and speed must be given due consideration with regards to economy.

[2] It can be concluded that the modern method of construction such as MIVAN formwork system are the key to the demand for efficient, sustainable housing. Also the quality and speed must be given due consideration with regards to economy.

REFERENCES COMPARISON BASED ONTIME

Work cycle

Mivan is a system for scheduling and controlling the Work of other connected construction trades such as steel reinforcement, concrete placements & electrical inserts. The work at site hence follows a popular sequence. The work cycle begins with the shuttering of the panels. It takes about 12-15 hours. It is followed by positioning of the bracket & platforms on the level. It takes about 10-15 hours simultaneously.

The de-shuttered panel are lifted & fixed on the floor. The activity requires 7-10 hrs. Kicker and External shutters are fixed in 7 hrs. The wall suttees are erected in 6-8 hrs. One of the major activity reinforcement requires 10-12 hrs. The fixing of the electrical conduits takes about 10 hts and finally pouring of concrete take place in these.

This is a well synchronized work cycle for a period of 7 days. A period of 10-12 hrs is left after concerting for the concrete to gain strength before the next cycle. This work schedule has been planned.for fixing reinforcement bars for floor slabs and casting of wall and slabs.

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