

Design and Application of Innovative Construction Tool

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ABSTRACT

The future direction of management of innovative technologies towards construction innovation. Our focus is to design the innovative tools which are inspired by the current requirement of the construction industry. Future directions and strategies of technology and knowledge fusion to develop future innovative constructions tools are to be presented. The innovative construction tools are very needful in the highly changing construction industry to fulfil the requirement if the less time for the completion of the any project with the better results at a minimum man power and at low cost for the work. ICT are the tools for sharing the knowledge of how various building construction activities can significantly increase production and profit of the work. The innovative Tools also helps in terms of energy saving efficiency, material cost efficiency, time saving and safety purpose and the precise work.

Keywords: *ICT, Innovative Construction Tool*

I. INTRODUCTION

The brick masonry is highly durable form of construction. It is built by placing brick in mortar in systematic manner to construct solid mass that withstand exerted loads. There are several types of brick and of mortars which can be used to construct brick masonry the bond in brick masonry, which adheres bricks together, is produced by filling joints between bricks with suitable mortar. The construction industry is one of the fast growing and very important industry. In the construction industry lots of operations related to construction are to be carried out, so there wants to the completion of any project of work is to be within the expected time, so while completion of any work, there should be lots of problems may be occurring into the site. This all activities will be results in wastage of time and the delay of the project. By considering above problems there should be requirement of provision of innovative method over the old or traditional method to overcome this problem. Then by providing proper way of any work within the project or completion of any work by providing the appropriate tool for the work then it will be results in the correct and quality work within the time.

The selection of the appropriate type and size of construction equipment affects often the required amount of time and effort and this is the job-site productivity of a project. Various types of advanced construction system have been researched development and implemented in specific building projects to try to solve the problems of the low productivity of waste by introducing advanced technologies into the work.

II. OBJECTIVE AND AIM

1. To provide user friendly innovative working method for brick masonry work.
2. To reduce time period for specified brick masonry work.
3. To achieve precise quality in workmanship.

4. To reduce wastage of material.

III. LITERATURE REVIEW

The U.S. construction market has enjoyed a strong and steady expansion in the last few years. This trend is expected to continue through the next decade. But this phenomenon may simply be an overall market maturity, which provides steady work, but not steady growth. In other words, the industry has passed from a period of rapid growth to a period of modest growth. Maturity implies characteristics such as intensified competition for market share, and incremental innovation in product and production processes.

The paper deals with an introduction and implementation of super performing building materials and techniques all in terms of energy saving efficiency of the material, cost efficiency, application feasibility, availability, vernacular characteristics, life span, etc. A material is considered smart only when it contributes something to upgrade the quality of building. With all those advancements in construction techniques and also with the demand of end users for the smart buildings we as constructors and designers are ought to introduce something new and smart to fulfil their demand. To understand all how and about of super performing construction materials we must study materials according to their use from very root to tip. By that way we can easily conclude and infer about the application, implementation and feasibility of that particular construction material and needs.

This article serves to introduce the May 2004 issue of *MRS Bulletin* on Construction Materials: From Innovation to Conservation. By volume, building materials are by far the most widely used type of materials. The most common construction materials concrete and wood are paradigms of complex and hierarchical materials, with a microstructure extending quasi-continuously down to the nanoscale. In the past, most improvements have been obtained by modifying the microstructure at the largest scales, for instance, by reducing the macro porosity. Recent advances in our understanding of the interactions and microstructure development show that the major levers for improvement from now on will rely on surface and colloid science and the science of complex materials, often at the nanoscale. This can lead to remarkable properties, such as self-compaction and ultrahigh strength, and even new functionality, such as self-cleaning through photo catalysis. Construction materials face a wide range of challenges today, many of which are linked to the need for more sustainable development: reducing the consumption of raw materials, reducing the energy used in processing, and increasing service life.

IV. METHODOLOGY

4.1 Analyzing the problem:

Analyzing The problems which is observed into the specific work of brick masonry work is seen that the method which used for the masonry is having the various drawbacks such as the wastage of the mortar, lower quality in workmanship and the time require to the particular work. By reconsidering all the demerits if this method and making the proper study of this method the new technic is introduces for the work which is advantageous for the masonry work. By the requirements the proper tool is introduced for fulfil all the requirements about the work.

4.2 Discussion of the problem:

We have need the proper guideline or any one tool for brick masonry work. And we have to choose the option of use on smart tool. There is need of basic material for design tool. There are many option are available i.e. steel, iron, silver, aluminum, wood etc. We have choose the steel because, this is low cost of construction & low corrodible than the other and this metal is also durable than the other, first we take two hollow square pipe for both outer side of brick. The first by choosing the appropriate material require for the instrument as per design and aligning it as per specified design. 1"sqare pipe as a main structure of instrument, 12mm thickness metal Rossi provided for the proper laying thickness of mortar on to the brick and for the locking of the instrument on to the bricks, the thin metal sheet to oppose the over spreading of mortar by the sides. By the above requirements the material is collected and arranges this all by the required shape and takes the trail on the site. Level of the main supporting pipe it should be at a same level the provision of the 12mm bar is at proper position and weld is provided at the top of bar, for the avoiding the over mortar spreading or the falling of mortar below the wall which is helps to reduction of waste

production. When the metal sheet is not provided to the tool then the main aim of the reduction in the waste is not achieved for this reason the metal sheet strips are provided on the top of the instrument.



Fig.4.2.1. Set the Instrument



Fig.4.2.2. Apply Layer of Mortar



Fig.4.2.3. Logitudinal Slide of Instrument

4.3 Working of instrument:

1. The working of instrument is by first laying the mortar layer at the proper position.
2. Then lay the first layer if the bricks over the mortar, check the outer line of the bricks by the use of line dories and put the all bricks in to the same line,
3. Then put the instrument over the brick layer at proper position and apply the layer of the mortar simultaneously over the bricks with the help of instrument throughout the all brick layer.
4. When the mortar is layered over the brick then apply the other layer of the brick and carry this all process throughout the wall.

V. RESULTS

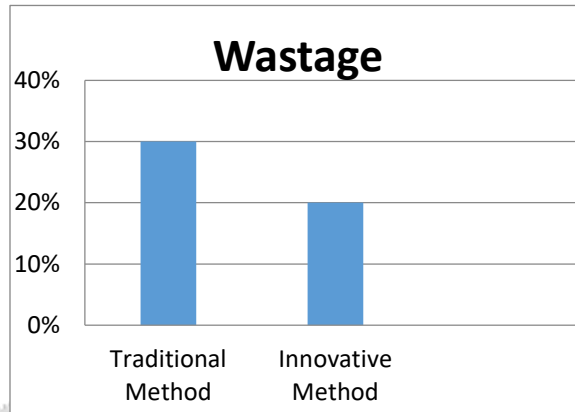


Fig.5.1.Material wastage comparison

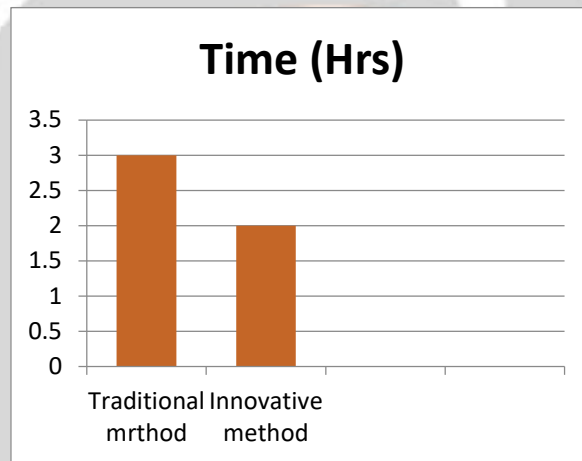


Fig.5.2.Time consumption comparison

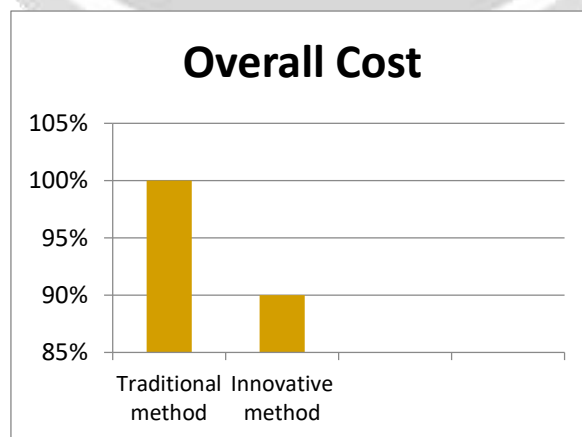


Fig.5.3.Overall cost

Items	Traditional method	Innovative method
Brick In cum.	500	500
Mortar	1:3	1:3
Wastage In %	30%	10 %
Time In hr.	3	2
Overall Cost In %	100%	90%

Table.5.1.Methods comparison

V. CONCLUSION

1. The time required for the particular work of brick masonry is reduced as compare to the time require for the work by traditional method of working.
2. The brick work which is carried out by using the innovative technic in that work the quality of the workmanship is achieved of high quality.
3. The waste material generation in the work carried out by the innovative method is 5 % only. Which is seen high in traditional method of work.
4. The overall cost is reduced which is depending upon the waste generations. Is reduced cost of the extra material require up to 10%-15%

VII. FUTURE SCOPE

1. Electronic device can be fitted for the level & alignment work.

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