

A Review on Effective Time and Motion Study on Construction Project: “A Case Study of Surat City”

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Abstract— Time and motion study is a work measurement technique for recording the times of performing a certain specific job or its elements carried out under specified conditions. Time study is a direct and continuous observation of a task, using a timekeeping device (e.g., decimal minute stopwatch, computer-assisted electronic stopwatch, and videotape camera) to record the time taken to accomplish a task. Motion studies are performed to eliminate waste. Under this project two sites are selected for time and motion study considering ten selected activities on field for time and motion study. Data will be collected for all activities under time study on field using stop watch and average time will be estimated and then further analyses under motion study to determine the optimum time required for performing selected operations and identify the extra time consumed on site. The analysis result will show that almost all the activities consumed more time more than what is required for actual work. The further future investigation and observations on field explore some reasons for extra time consumption which included inadequate material handling, ineffective method of work, poor planning of inventory poor layout and utilization of space. If these factors are taken into consideration the activities time can be brought nearer to ideal time requires.

Key words: Safety Factors, Safety Programs, Construction Projects, Success

I. INTRODUCTION

Time and motion study (also referred to as motion and time study, the terms are used interchangeably) is the scientific study of the conservation of human resources in the search for the most efficient method of doing a task. A fascination with the word “efficiency” began in the late 19th and early 20th centuries when it was considered one of the most important concepts. Time study began in the 1880s as a means of wage-rate setting by Frederick W. Taylor, who is regarded as the “father of scientific management.” It consists of a wide variety of procedures for determining the amount of time required, under certain standard conditions of measurement, for tasks involving some human activity. Motion study was developed by Frank B. Gilbreth and Lillian M. Gilbreth and consists of a wide variety of procedures for the description, systematic analysis, and means of improving work methods.

It is difficult to separate these two aspects completely. Therefore, the combined term usually refers to all three phases of the activity: method determination, time appraisal, and development of material for the application of these data. Frank and Lillian also broadened scientific management by including the human element, therefore using psychology to gain the cooperation of employees. Motion and time analysis could be used to help find a preferential way of doing the work and could assist in effectively managing or

controlling the activity. This approach has been successfully applied to factories, hospitals, department stores, housework, banks, cafeteria work, libraries, music, and to many other human activities. For instance, factories have used it to reduce wasted time and improve the time to complete a task, while banks use it to help team members reach their sales goals. However, the goal of a time and motion study is not simply efficiency. These studies are done to create a baseline that can be used in the future when evaluating procedural, equipment, or personnel changes.

II. NEED OF STUDY

- 1) To identify problems in the production work process.
- 2) To improve the work process in terms of production time.
- 3) To analyze the present method of doing job systematically.
- 4) To measure the work content of a job by measuring the time required to do the job for a worker.
- 5) To do work sampling for various construction activities.
- 6) To find correlation between various human activities related to concreting and establish regression equation between them.
- 7) To improve operational efficiency.
- 8) To find the productivity and increase the productivity by ensuring the best possible use of human resource, machine and material and to achieve the best quality product.

III. RESEARCH METHODOLOGY

The definition of a time standard is “the time required to produce a product at a work station with the following three conditions:

- 1) A qualified, well-trained operator,
- 2) Working at a normal pace,
- 3) Doing a specific task.

A. Preparing for a Time Study

- The steps in the process studied must already be standardized; e.g. sequences have been determined.
- All the information about staff members should be available.
- Operator must be fully qualified, trained, and acquainted with standardized process being studied.
- Must inform supervisor and department head.
- Make sure all materials are available for the process.

B. Time study Equipment

- Stop watch
- Study Board
- Time study form

C. Following are the Format for the Collection of Data for Concrete

Slab Concrete Work							
Sr.No.	Mixing Material	Through Material into trolley	Transfer Concrete from GF to FF	Apply Concrete at Location	Spread Concrete	Vibrator	Finishing Surface
1							
2							
3							
4							
5							
6							
7							
8							
9							
10							
Average							

Fig. 1: Sheet for Slab Concrete Work

Material Collection Sheet						
For Sand (FT)						
Labour	Time to fill trolley	Transfer Material	Through Material into Mixer Machine	Return Time	One complete cycle time	Unnecessary Time
1						
2						
3						
4						
5						
Average						

Fig. 2: Material Collection Sheet for Sand

IV. CONCLUSION

From the discussion of the parameters, it can be concluded that this process can be improved based on the parameters that cause the problems. With combination of work process and time measurement and the changes of production layout, it will improve the current work process. These modifications are made by eliminating the wasted time and reduction of the work contents. From the comparison between current and new work process. These improvements was successful to achieve the project goals and objectives, which the improvements was included the processes, production layout, economy in human effort and the reduction of unnecessary fatigue.

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