

A Review on “Causes and Impact of Rework on Residential Construction Project”

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Abstract— Time and cost are very important factor for successful and profitable construction project. Any construction project becomes success when it is finished within estimated cost and Time. Schedule and cost overrun are becoming a headache for owner as well as the other parties involved the project. The major contributor for schedule and cost overrun is rework. Rework has negative impact on the quality of work and on the parties involved in the construction project. Construction projects are divided into various stages and these stages includes various task due to this the project becomes complex in nature. Errors, omissions, defects etc. are clearly going to happen when complexity is involved. Rework is a result of these error, omission and changes. Project’s cost, time and productivity gets affected negatively when rework is involved in the project. Supervision plays vital role in reducing on field rework. Whenever rework occurs a proper documentation about the rework should be prepared and stored so that in future same rework can be avoided. Study on rework shows that the rework cost may increase to 10% of project cost. So rework cannot be ignored in a construction project. Performance of project gets adversely affected by the added cost and tight schedule due to rework.

Keywords: Rework, Cost and Time Overrun, Questionnaire, Direct Cost

I. INTRODUCTION

Construction projects are divided into various stages and the stages include various task due to this the project becomes complex in nature. When there is complexity errors are bound to happen. Errors results into rework. Rework is performance of certain activity more than one time. Rework leads to waste of material which results in loses so special attention should be given towards avoiding rework in the project. Rework might not be totally eliminated however it is preventable. The construction industries faces lot of problems such high cost construction, overrunning schedule and late deliverance of project to owners all this projects are mostly results of rework in the project. Rework are the non-value adding events in the project which affect the productivity and performance of the construction project.

Rework is defined as the needless effort of redoing an activity that was wrongly done the initially. The undesirable penalty of rework comprise reduced profit, damaged to status, amplified turnover of management and workforce, lesser productivity, high costs, and finally, costly legal action between parties involved in the project over accountability for overruns and delays. Occurrence of the rework has adverse impact on the factors project such as cost, time, and shareholders dissatisfaction etc.

If proper attention on supervision is not kept rework may affect the final cost of project and may hamper

the reputation of the organization. Many times same mistakes are repeated on the number of projects so proper data collection about rework should be kept and it should be made easily available for future work to avoid same mistakes.

The impacts cause due to rework has adverse effect on the construction project so proper preventive measure should be taken to mitigate the rework. Proper supervision is also a precautionary measure for reducing the errors caused by unskilled and unprofessional works.

II. LITERATURE REVIEW

The Existing literature related to rework have been mostly written by three institute or researchers. They are the Construction Industry Institute (CII), the Construction Owners Association of Alberta (COAA), and Dr. Peter E. D. Love, a researcher from Australia. Dr. Peter E. D Love focused on the project management relatively more than the field construction, and studied rework and its causes under the condition of a whole project life cycle throughout the stages of planning, design, and construction. Peter E. D. Love’s research can be viewed as relevant to the project management level, and it explains impact and causes of rework in the project management process. CII and COAA are research institutes founded for the benefit of the construction industry; they are mostly focused on finding efficient and economical approaches for contractors’ construction activities. The research done by these two institutes is therefore from the viewpoint of rework on construction sites and has investigated an effective approach to the control of field rework with respect to producing better performance in the areas of process programming, appropriate resource allocation, and human performance management.

2017 the paper discusses about rework problem faced in construction industry of Gaza strip. For identifying the factors contributing to rework extensive literature review was done and with the help of case study data regarding the various defects and deviation leading to rework were found.

For fulfilling the objective of paper extensive survey was done. The methodology was divided into two parts. The 1st part included preparing the questionnaire. In this all causes of rework were identified through extensive literature review. The total causes where modified and were arranged under 7 major groups. These causes were structured under a questionnaire survey and were used in 2nd stage. In 2nd stage the questionnaire was distributed among the people such as companies, constructors, engineers, supervisors, project managers etc and their response were collected.

In the paper author concluded that major categories foe rework are contactors related rework causes and human

resource related causes. The study showed that the import causes of rework that have impacts on project performance are

- 1) Attempt to fraud
- 2) Competitive pressure
- 3) Ineffective management
- 4) Schedule pressure
- 5) The absence of job security

(2011) the objective of paper is to analysis and discussion on the rework cost experienced on case studies in Nigeria

The paper conclude that most of projects in Nigeria overruled the initial estimated time and cost. The study suggested that due to rework the time is overrun by 38.26% and cost by 9.88%. According to author recorded rework cost in new building was 5.06% and in refurbished building was 3.23%. the rework cost in refurbished building is less than the new building because refurbished building projects had a base frame of design so the scope for changes were minimum as compared to new building project. Finally author concluded that to reduce rework a consensus should be reached for work mechanism for minimizing the changes during construction phase.

(2006) in this paper the main aim of author is to recognizing the important rework items and naming the causes of rework in construction project. Paper also summarizes the rework reducing factors and presents a framework for management of rework. In methodology of paper author proposed a framework for systematic management of rework. The paper concluded that by creating the awareness about the rework as well as use of structured system for rework management helps in reducing the rework.

(2016) in this paper, author underlines the main causes of the rework and the impact of rework on the overall project performance. The author also concentrated on finding the effective strategies to reduce the rework during construction project. According to paper rework is a process of redoing work more than one time which leads to time overrun and wastage.

III. METHODOLOGY

- Step 1: For the Research firstly Topic was decided, then previous literature related to topic were collected and studied. For collection of literature mostly ASCE Journals were referred. Some local journals were also referred for getting the idea of general condition related to topic.
- Step 2: After Studying the literature Related to topic Literature review was prepared. Each literature review of paper was divided into three parts. Second part included the research methodology used by the author for attaining the aim and objective of the paper.
- Step 3: With the help to literature study a questionnaire was prepared. This questionnaire consisted questions related to awareness related to rework, Factors that are responsible for causes of rework and the affects which affect impact the construction project.
- Step 4: In this step questionnaire survey was conducted by visiting the construction firms and constructions

sites in the Amravati city. For survey all the residential construction sites and firms working on the residential construction sites were visited & questionnaires were filled from them.

- Step 5: After collection of responses of questionnaire a excel sheet was prepared. In excel sheet all the responses were recorded. Calculation of the questionnaire was done by using the relative importance index formula. After analysis RII index of each questions & Factors were recorded.
- Step 6: After Analysis of RII Index the tables, Rank list and graphs were prepared. In tables category wise Causes and impact factors were inserted with RII index and ranks. In Rank list was made with respect to the RII index and top ten causes and factors impacting rework were included. Graphs were prepared from the rank list.
- Step 7: In this step the finds and conclusion of the research were decided by mapping the objectives of the research. In conclusion Top three causes, Factors impacting the project, rework reduction measures and top questions related to awareness of rework are mentioned.

IV. EXPECTED CONCLUSION

Construction Industry faces the problem of rework whenever complexity of project is involved with the human resource working for the project. Construction rework is problem for project because it effects the time and cost constraint of the project which are important in the construction project. Rework has negative impact on the parties working in project which may lead into conflict. Rework mostly occurs during the initial design, planning and during construction phase. The main causes of rework identified are client related causes, design related causes and human resource reacted .As per the analysis of questionnaire survey it was found that the questions regarding the awareness of rework

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