

## Impact of Change of Construction Drawing on Project Works

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**ABSTRACT** - Construction documents forms the core of any construction projects it includes contract documents, plans, drawings etc. Construction drawings are the graphic representation of what is to be built. The construction drawing should be precise and should be well coordinated in order to avoid uncertainty and confusion. If the construction drawings are drawn with proper coordination then it will minimize the delays in the construction as the changes in the drawing throughout the design and construction process can lead to budget and schedule overruns and also the delivering of project on time.

The objectives of this paper is to determine the various factors leading to change in construction drawing and how this changes can affect the completion of project in scheduled time and budget through various case studies. In order to determine the main factor causing the change in drawing the data collected through various site visits were analyzed through Minitab software. To determine how the impact of change in drawing can be minimize if the drawings are made in building information modeling.

**KEYWORDS:** Construction drawing, Time, Budget.

### I. INTRODUCTION

Construction drawings is the crucial part of the construction project, to complete the construction within stipulated time period and budget it is necessary that the drawing should be precise and well coordinated.

Construction drawing is used as a communication tool between the client and the contractor. Construction drawing forms the medium through which the client expresses his requirements to the contractor, and accordingly the execution of work is done. The drawings provide both the graphic as well as written information, about the project. The detailed information such as walls, doors, furniture and color of wall and so on, are all specified. In a construction project drawing consists of generally two parts one is architectural and the other is engineering. The complete drawing set is used to find the cost of the project. There are various ways in which construction drawing is prepared it can be prepared by hand, computer aided design or building information modeling software. But it is more common for them to be prepared using computer aided design. This paper aims at determining various factors contributing change in drawing during construction and how these changes can lead to increase in cost and time of the project. And how the implementation of proper design software can lead to minimize these effects.

#### 1.1 Objective of Project:

- 1) To determine how the use of improper Design documents in the project life cycle influence the client's satisfaction with duration, cost and quality and overrunning the duration and budget.
- 2) How the implementation of Proper design software can help to achieve targets of any construction projects.

### II. LITERATURE REVIEW

**Iliyas J. Suleiman, Valentine G.M Luvara:** This paper determines the various factors causing change in drawing by collecting data through questionnaire survey and then the analysis of collected data were done using SPSS 2.0. Based on the analysis done it was found that the client's factors and design consultant factors are the major factors causing change in design during construction. To avoid this changes the measure taken by them were to ensure feasibility study before design, effective involvement of everyone involved in construction activity during design stage, provision of proper time at the time of designing and provision of clear brief by the client.

**M. Gokulkarthi, K.S Gowrishankar:** The paper focuses on the impact of change order on construction project. Questionnaire survey was done to collect the data and then analysis of collected data were done based on which it was concluded that the owner's requirement is the major source of change in plans.

**Qihao, Weiming Shen, Joseph Neelamkavil, Russ Thomas:** This paper determines the various factors causing delay in project schedule and how it affects the completion of project in stipulated time period and budget. The primary cause of change that were found was the owner's requirements and designer's errors and omissions. They have concluded that innovative, effective and practical solution has to be developed that are adaptable by industry in order to resolve this changes.

**Sepani Senarate and Jeevana Mayuran:** Here author has done questionnaire survey was done to determine the reason for poor documentation in Sri-lankan construction industry. Based on the survey they concluded that there is a gap between the requirements and the document usage. To overcome this problem and to fill the gap suggestions related to the procedures, awareness of the staff and allocation of resources were revealed through survey.

**Luis F. Alarcon and Daniel A. Mardones:** This paper determines the design defects and their corresponding impact on the construction industry. The data were collected through interview with the various industry experts. The problem which was identified were incomplete drawing, change in order, poor design quality and their impacts were rework, delay in construction and increase in cost. To overcome this the author suggested that proper information must be given to the designers before the start of drawing and identify the various documents involved in the construction project in order to avoid rework and all types of waste in designers office and construction site.

### III. METHODOLOGY AND DATA COLLECTION

A detailed literature review was done to identify the problems and then the data were collected through site visit which was done to determine what are the various factors causing change in construction drawing. During the site visits an unstructured interview was done with the engineers to find out the factors causing the change in drawing. The factors which were identified were owner's requirements, neglecting the geological condition at the time of planning, change in the requirement of builders, change of drawing due to structural reason etc. And then analyses of collected data were done in Minitab software in order to determine the main factor causing change in drawing. After the putting the values in the software the mean for each factor were obtained and then ranking were done based on the mean value, giving first rank to the one having higher mean value and last to one having least mean value.

### IV. RESULT AND ANALYSIS

Analysis of collected data is shown in the table 1 which shows the various factors causing change in drawing and their corresponding mean value and based on its mean value ranking is done.

Based on the analysis it can be seen that owner's requirement is the main factor causing change in drawing followed by geological condition of soil and so on.

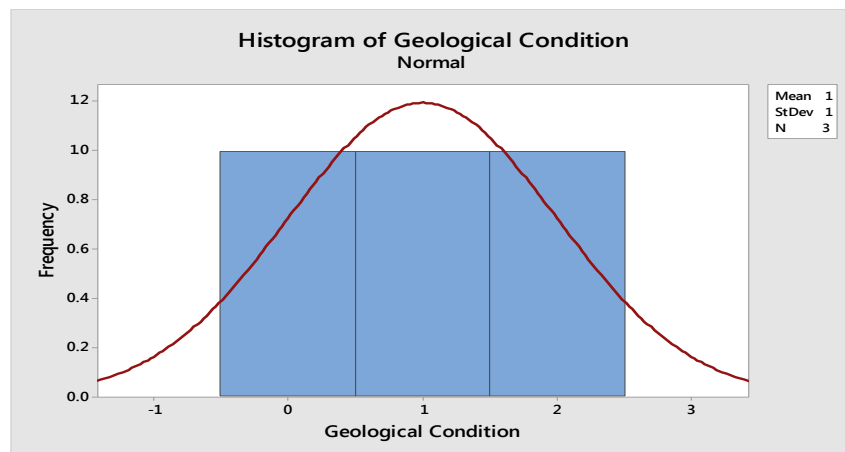


Fig1. Output from Minitab

**Table1.** Summary of various factors causing change of drawing during construction

Sr. No	Factors causing change of Drawing	Mean	Rank
1	Structural Reason	0.5	3
2	Owner's Requirements	1.5	1
3	Geological condition	1	2
4	Incorrect drawing	0.5	2
5	Incorrect Survey	0.5	3
6	Financial Reason	0.5	3
7	Lack of Supervision	1	2
8	Change of Builder Scheme	0.5	3
9	Political Reason	0.5	3

## V. CONCLUSION

From the above result obtained it can be said that there is always some or other factors causing change in drawing due to which there is increase in cost and duration of project. The effect of this change can be minimized if the drawings are made in building information modeling 360 instead of computer aided design. As building information modeling software provide an option to calculate the quantity of various materials at the time of drawing only.

## VI. REFERENCES:

1. Iliyas J. Suleiman, Valentine G.M Luvara 'Factors Influencing change of Design of building Projects during Construction Stage in Dar-es-salaam Tanzania' International journal of Construction Engineering and Management 2016.
2. M. Gokulkarthi, K.S. Gowrishankar 'A Study on Impacts of Change order in construction Projects' International journal of Science and Engineering Research 2015.
3. Qihao , Weiming Shen , Joseph Neelamkavil , Russ Thomas. 'Change management in Construction Projects' International Conference on Information technology in construction Santiago, Chile.
4. Sepani Senaratne and Jeevana Mayuran. Developing Countries, 20(2), 81-95,2015. "Documentation management Based on ISO for Construction Industries in Developing Countries"
5. Kolawale, A.R (RQS) and Olaoti A.S. "Record keeping and management in construction: Its Importance and Instructions", The Nigerian Academic forum Vol.7 No. I October 2004.
6. Mamoon Mousa Atout. 'Delays Caused by Project Consultants and Designers in Construction Project' International Journal of Structural and Civil Engineering Research 2016.
7. Maria Koglovska , Daniela Mackova , Marcela Spisakova. 'Survey of Construction Management Documentation usage in Planning and construction of Building Project' World multidisciplinary Civil Engineering- Architecture-Urban Planning Symposium 2016.
8. Luis F. Alarcon and Daniel A. Mardones. "Improving the Design Construction Interface.