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DELAY ANALYSIS OF A CONSTRUCTION PROJECT- A CASE STUDY

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Abstract - *Construction technology has become an essential part of any of the project, for timely and economical completion of the project. A proper construction planning and schedule acts as a main role ford different purposes. By using the schedule, we can know the merely completion of the project, contractors can recruit the necessary manpower; can demand shifts or equipments to speed up the project. The most important function of the project management is to plan and control the project objective like time, budget and setting out of resource productivity standards to achieve the objectives of the project. Delay happens in all construction projects. Where construction project will vary in size, some will be in small. In vast projects, analysis should be done for the purpose on making right decisions on time and cost compensation claims. Many type of software's are available to plan, execute and control the project; with the help of these software's the project management has become easier to evolve the construction project. Large quantities of different kind of resources are required for execution and the risk is more in case of big projects. So, planning and scheduling in big projects is essential. In this study, an effort is made in planning, scheduling and delay analysis and updating of various activities which is done using MS project.*

Key Words: **Construction Management, Planning, Delay, Labour Productivity, Scheduling, Tracking.**

1. INTRODUCTION

Construction industry plays an important role in the economic growth of a country. It is the process of implementing the plans, ideas, standards, specifications and assigning the resources into a physical facility to meet the specific requirements of owner.

Construction management can be defined as the accomplishment of results through the combined effort of the consultant, client and designer. Construction is a very unique and creative practice which coverts four M's of the construction-Material, Manpower, Machinery and Money into a systematic structure. Thus construction management contains Planning, Executing and monitoring the construction activities in a specific project.

1.1 Project Planning, Scheduling and Controlling

The main aim of the construction management is to plan and schedule the resources within the frame work of a project. The guidelines and procedures of the construction management direct the managers how to utilize the resources during the construction process. Before execution of the work on the site all kinds of office works such as planning, designing, estimating, negotiating, purchasing, scheduling, controlling etc. should be done carefully.

1.2 Construction Delay Analysis

Delay is one of the common problems in the construction project. Delay of a construction project is defined as late completion of the project as compared to the planned schedule. Construction delays are often resulting of miscommunication between contractors, subcontractors, owners and suppliers.

These types of unrealistic exceptions are usually avoided by clean and efficient planning mechanism, which clearly specifies the work and timetable to be used. Delays in construction project are quite expensive; sometimes they may result in severe damages to the involved parties.

1.3 Objective of the Study

- Detailed literature study to define the various causes of delay in construction projects
- Study on ongoing Project site to observe the activities and to identify delay factors
- Determination of Critical Path using MS Projects
- The analysis also involves the process of scheduling and tracking of a construction project activities in software and related catch up programs due to delays.

2. METHODOLOGY

- Site Investigation.
- Studying Of BOQ & Drawings.
- Study On Labor Productivity.
- Scheduling.
- Tracking & updating of project.
- Delay Analysis.
- Results & conclusions.

2.1 Brief Details of Project

Nature Walk is a Villa project consisting of 14 Villas of 3BHK and 4 BHK.

- Name of the project: Nature Walk Project.
- Location: KR Puram, Bengaluru.
- Contractor: Sri Laxmi Constructions.
- Client: Renaissance Holdings.
- Built up Area: 8400 sq-ft-9880 sq-ft.
- Super Built-up Area: 9450 sq-ft – 11115 sq-ft.
- Site area: 14 Acres.
- Building Type: Villas.
- Number of floors: G+2.
- Total number of Villas: 147.

2.2 Project Specification

- Structure
  - Villas are Reinforced Cement Concrete with G+2 Floor.
- Concrete
  - M10 grade for PCC, M25 grade for Footing, Columns, Beams & Slabs.
- Steel
  - High Yield Strength Deformed bars Fe-500 is used.
- Masonry Work
  - 4" & 6" Internal and External Concrete block walls.
- Plastering
  - External sand faced plaster.
  - Internal plaster with putty.
- Painting
  - External Walls-Cement texturing with Apex/Ace emulsion.
- Windows
  - UPVC.
- Flooring
  - Balcony -Anti Skid Tiles, Kitchen- Vitrified Tiles, Living/Dining- Marble, Granite.

2.3 Labor Productivity and Manpower Requirement

The required manpower for each activity for carrying out that particular activity efficiently without compromising on the quality is allocated and calculated based on labor productivity.

Table: 2.1 Duration delay table

Task Name	Duration	Baseline Duration
Nature Walk Project B-08	**472** days	406 days
VILLA 99 & 100	**439** days	360 days
Nature Walk Project B-08		
Sub Structure	**106** days	88 days
Earthwork	6 days	5 days
Plain cement concrete	59 days	50 days
Footing	37 days	30 days
Plinth Beam	48 days	40 days
Ground Floor	63 days	59 days
1st floor	62 days	52 days
2nd Floor	**36** days	28 days
Staircase	13 days	10 days
Block Work	**99** days	75 days
Wall Tiling	21 days	15 days
Plastering	**132** days	101 days
Internal Plastering	**53** days	37 days
Ceiling Plastering	24 days	19 days
Wall Plastering	40 days	28 days
External Plastering	**76** days	59 days
Painting	50 days	46 days
Internal Painting	42 days	32 days
External Painting	20 days	39 days

3. CONCLUSIONS

On analyzing it's been found there is a delay of 66 days in the completion of the project. The critical activities of the project are foundation, casting the floor slab, block work, external plastering, painting and doors. Inspire of critical activities, there are some additional activities where the project experienced difficulties in execution and delay in completion.

From the delay analysis an amount of Rs. 620200/- has been incurred to the project which is an additional loss to the project and simultaneously over shoots the budget allocated to the project. The main causes of the delay in the project are both excusable and non-excusable delays, which are identified by the occurrence and experience. The main delays were recorded and the loss of productivity and cost loss has been calculated.

In this study, the main causes of the delay occurrence are rain, unskilled labors, shortage of skilled labor, poor workmanship, shortage of labors, inadequate of availability of materials, non-availability of materials, delay in payment to the contractor by client, partial payments to labor by contractors. These delays imply that contract related delays require adequate attention, because these delays topped with huge loss to the company and project duration overrun. Time overrun and cost overrun effects are more in this project. So, necessary action should be adopted to avoid the delays which lead to project loss.

REFERENCES

[1] Megha Desai and Rajiv Bhatt (April 2013). "Critical Causes of Delay in Residential Construction Projects: Case Study of Central Gujarat Region of India", International Journal of Engineering Trends and Technology, Vol. 4, Issue 4, pp 767-768.

[2] Siddesh K. Pai and J. Raj Bharath (March 2013). "Analysis of Critical Causes of Delays in Indian Infrastructure Projects", International Journal of Innovative Research and Development, Vol. 2, Issue 3, pp 251-263.

[3] Enas Fathi Taher and R. K. Pandey (Feb 2013). "Study of Delay in Project Planning and Design Stage of Civil Engineering Projects", International Journal of Engineering and Advanced Technology, Vol. 2, Issue 3, pp 456-461.
[4] M. Haseeb, Xinhai-Lu, Aneesa Bibi, Maloof-ud-Dyian and Wahab Rabbani (Sept 2011). "Problems of Projects and Effects of Delays in the Construction Industry of Pakistan", Australian Journal of Business and Management Research, Vol. 1, No. 5, pp 41-50.
[5] Abedi M., Fathi M. S. and Mohammad M. F. (2011). "Effects of Construction Delays on Construction Project Objectives", Scientific Conference Malaysia.
[6] Aswathi R and Ciby Thomas (December 2013). "Development of a Delay Analysis System for a Railway Construction Project", International Journal of Innovative Research in Science, Engineering and Technology, ICEE, Vol. 2, Special Issue 1, pp 531-541.
[7] Murali Sambasivan and Yau Wen Soon (2007). "Causes and Effects of Delays in Malaysian construction industry", International Journal of Project Management, 25, pp 517-526.
[8] Sadi A. Assaf and Sadiq Al-Hejji (2006). "Causes of delay in large construction projects", International Journal of Project Management, ELSEVIER, 24, pp 349-357.
[9] Abdalla M. Odeh and Hussaien T. Battaineh (2002). "Causes of Construction delay: traditional contracts", International Journal of Project Management, PERGAMON, 20, pp 67-73.