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Augmentation of batching plant productivity without affecting the quality of concrete

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ABSTRACT

This paper proposes the problem of delays in the construction industry. The main purpose of this study is to identify the delay factors and the effect on the project completion by doing a case study in projects. By analyzing the reasons for the delay, possible recommendations are given. The most important causes of delays shortage of material like cement and aggregate in Production of concrete, weathering condition, methods of operation, shortage of man power, frequent change in staff, poor site management. This project is highlighting the study of Batching plant productivity without affecting the quality of concrete by doing a study of various batching plants sites for the factors which could affect the output of batching plant and observed such factors in time. The major effects of delay are cost impact, reduced labor productivity, postponement in work, change in labor allocation etc. Not all delays can be rectified, but few of them can be overcome by improving management responsibilities This paper explains why productivity at a construction site is reduced due to management factor mechanical factor and others.

Keywords: Causes of Delay, Effect of Delay, Recommendations to Overcome Delay.

1. INTRODUCTION

A concrete batch plant is a well-developed and industrialized plant, where the concrete is combined before transferring it to the site using transit mixer and ready to be placed. In the 1930s, the first Ready Mix Concrete (RMC) factory was constructed but the industry was not used frequently until the 1960s and then it expanded gradually. Evaluating the production of the Ready Mix Concrete (RMC) batch plant is not obvious and straight forward since it involves a lot of uncertainties in evaluating durations of each process. These uncertainties are due to many factors, such as operations management, equipment conditions, operator's skills, weather conditions, and others.

Delay as referred in construction is prolonged construction period and disruptions of events that disturb the construction programmer. Delays and disruptions are among the challenges faced in the course of executing construction projects. Delays, as well as disruptions, are sources of potential risks that current studies are looking into ways to manage

2. OBJECTIVE

- To study the productivity concept...
- The main objective of batching plant is to produce the large quantity of concrete in the least time.
- To find out the various sources of delay and how it affects the productivity.
- And to identify the major causes of delays in construction project.
- To recommend strategies for minimizing delays in the project based on the finding of the study.

In [2] has examined that, Efficient RMC truck dispatching is a critical task for batch plant managers. They must generate dispatching schedules quickly in order to balance operation batch plant production with construction site needs. Factors that affect delay in the concrete batching plant operation are identified and analyzed. The study summarizes the main causes of delay that affect construction project.

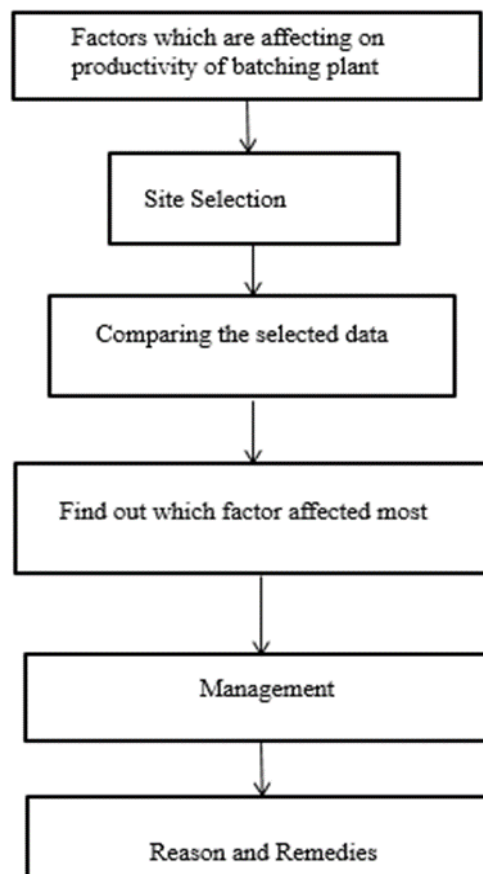
In [3] has examined that, the study summarizes the main causes of delay that affect construction project. Case studies of two construction projects were done to identify and analyses the reasons and effects of the delay. The most important causes identified were: delay in payment by the head office, frequent change of staffs, poor site management, improper management of the engineers, delay in supply of material and lack of manpower. An analysis of the responsibilities of delay causes suggests that a joint effort based on teamwork is required to overcome delays. In summary, this project summarized some reasons behind the delays caused in these sites and proposes some possible recommendation to overcome those delays. Further research is needed to investigate the limitations and potential improvements to causes of delays within each construction site

In [4] has examined that, Factors that affect delay in the concrete batching plant operation identified and analyzed. Based on these identified factors, several cost management models have been developed to assess concrete batching plant efficiency and effective expenses. The result shows for site I that management delay condition has the highest probability of occurrence, delay per cent, and relative delay per cent. Several cost management models have been developed to assess concrete batching plant efficiency and effective expenses. This project is highlighting the study of Batching plant productivity without affecting the quality of concrete by a prolonged recapitulation of various batching plants sites for the factors which could affect the output of subject batching plant and descry and predicament shooting of such factors in time. The study summarizes the main causes of delay that affect construction project.

3. METHODOLOGY

The methodology employed in this study was to observe various causes of delays in ACC RMC plant and NUVOCO RMC plant respectively. Following flow chart shows the methodology which is conducted to find out the various causes of delays in the plant.

4. FLOWCHART



STEP 1-

The study area of the project, the literature were collected and thoroughly studied, found the various factors which cause the delays in RMC plant.

Following are the factors which affect the productivity of RMC plant:

- I. Weathering Delay
- II. Cement Delay
- III. Aggregate Delay
- IV. Management Delay
- V. No Work
- VI. Mechanical Delay
- VII. Pouring Delay

STEP 2- Site Selection

To determine the productivity of batching plant two different sites were chosen, so as to find out the seven factors and which factor most affect the productivity of concrete.

STEP 3- Collection of data

After selecting the site, visit the ACC RMC plant in Sion region and NUVOCO RMC plant in Wadala region. Visit the site and collecting data.

STEP 4- Comparison of collected data's

By comparing the data of both site of each factor. This helps us in analyzing the delay reasons of each factor and identifying the effect of delay in detail.

STEP 5- Recommendations

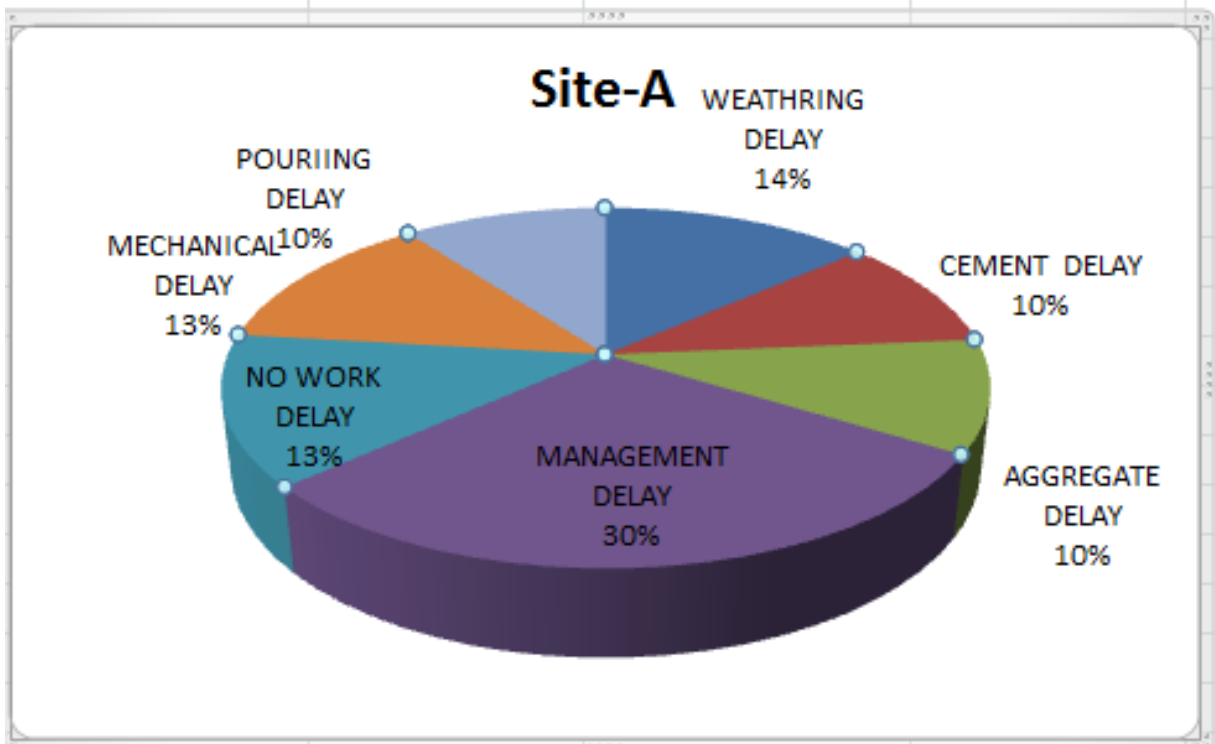
By continuous observations and site visits the delay reasons are analyzed and the mistake made is sorted out. With this analysis possible recommendations to overcome delays are suggested.

5. CASE STUDY

Two batching plants was chosen in Mumbai region. Where we visit and performed for 4hrs in the day. A case study of two different sites A and B.

a. CASE STUDY OF A

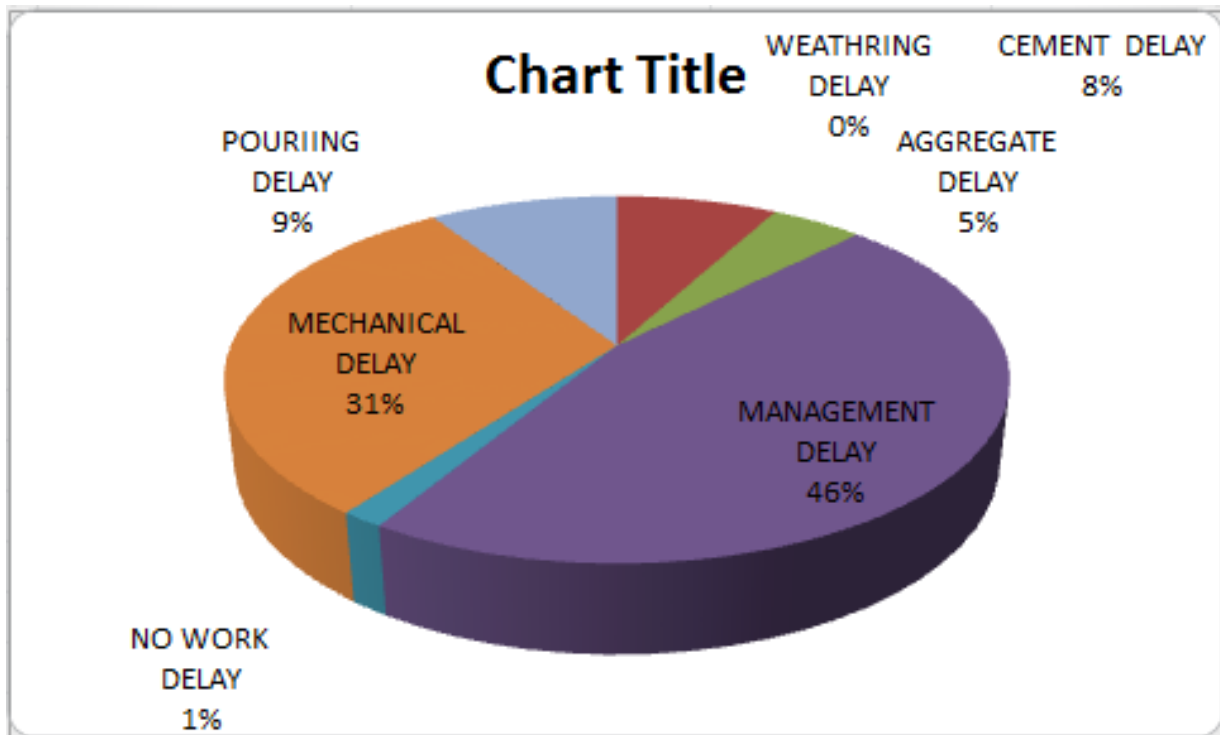
Plant Name: ACC RMC PLANT (SION)
Duration of the Study: 24 DAYS
Performed date: 07th OCT 2017 to 31st DEC 2017
Plant Capacity: 2cumec
Daily Production: Approx.150cumec



TOTAL DURATION	WEATHRING DELAY	CEMENT DELAY	AGGREGATE DELAY	MANAGEMENT DELAY	NO WORK DELAY	MECHANICAL DELAY	POURIING DELAY
5760	240	180	180	527	240	230	182

b. CASE STUDY OF B

Plant Name: NUVOCO RMC PLANT (WADALA)
 Duration of the Study: 24 DAYS
 Performed date: 06th JAN 2018 to 31st MAR 2018
 Plant Capacity: 2.5cumec
 Daily Production: Approx.200cumec



TOTAL DURATION	WEATHRING DELAY	CEMENT DELAY	AGGREGATE DELAY	MANAGEMENT DELAY	NO WORK DELAY	MECHANICAL DELAY	POURIING DELAY
5760	0	105	60	613	20	405	123

6. RECOMMENDATION

- Initially lethargic attitude of management team must be avoided. This is one of the main reasons for delay. Supply of material at the site at the right time should be Taken care by the site engineer.
- Enough concrete plants must be installed.
- Labor holidays must be taken into consideration while scheduling.
- Stock yards must be built to store materials on site.
- Avoid frequent change of staffs.
- Staffs in the site should be appointed with experience in the same field.
- Payment to the labor must be given at the right time without fail because most of the delay in the project is Due to a shortage of labour.
- Indent planning must be done in advance to avoid material supply delay since the material is also one of the major delay reasons.

7. CONCLUSION

The study summarizes the main causes of delay that Affect construction project. Case studies of two RMC PLANT were done to identify and analyses the reasons and effects of the delay. The most important causes identified were a frequent change of staffs, poor site management, improper management of the engineers, delay in supply of material and lack of manpower.

After observing two plants we concluded that management and mechanical delay most affect the productivity of concrete.

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