

Analysis of Production Loss In Terms Of Time and Money Due To Insufficient Material Management

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Abstract: There are many methods of management should be taken in consider to improve an ability of construction management and productivity of work. Many times there has been delay of material received through material supplier agency due to many nominal reasons. It could be solved by many alternative methods of transitions.

The main aim of the project is to provide utility to maintain day to day operation of building. The methodology develop in this research book will help working managers to store all transition electronically in a system, which turn saves lot of time, money and energy.

Analyzing all the delay from work activity of certain month of time. Recording all the material ordered, material received from agency, the work has been executed at their activity time. Calculating and creating material balance sheet. The goal of project is to develop and study the efficacy of a simulation for construction project time management.

Keywords: Construction materials, Cost control, Materials management.

1. Introduction

Materials management may be an important element of the construction business. As such, organizations ought to perceive the consequences of correct materials management techniques on the effectiveness of project expedition. Extensive literature and reports deplore the dearth of potency and productivity within the construction industry. Too often, construction comes bear from delays, budget overruns, and claims.

A properly implemented materials Management program can achieve the timely flow of materials and equipment of the job site, and thus facilitate improved work face planning, increased labor productivity, better schedules, and lower project costs. As a result to avoid mess up on the site and have a smooth flow of materials on the site proper site material management is very essential on construction projects. Responsible personal should put in efforts for improving the site material management for Better material quality control, proper material storage, surplus and obsolete management, material accounting, etc.

A proper material logistics implementation on the site will reduce the probable delays, material damages, waste produced on site, etc. The construction industry is basically different from the manufacturing world. Each construction

project entails the development of a single one-of-a-kind product that requires the joint efforts of many. A construction project is a complex transaction involving a set of products, services and construction works designed specifically to complete a specific as set for a customer within a certain period of time. Because owners, contractors, subcontractors, and suppliers collaborate for a limited period of time to deliver the project to the client and then move on to other projects, all actions are short-lived. The activities are highly interdependent and engineering.

1.2 Need for the Study

Site material management could be a method for dominant field and workplace activities on Construction web site associated to the materials. {The web site the location the positioning} Material management system tries to insure that the correct quality and amount of Materials are befittingly delivered and handled on site in a very timely manner. Coming up with and dominant all of the efforts necessary to confirm that the right quality and amount of materials are properly per a timely manner and most significantly are obtainable at the purpose of use once needed. So web site material management is a crucial component in Project management. Materials management is that the system that represents a serious Expense in construction, therefore rising web site material management improves opportunities for reducing the project prices. Dangerous management may result in accumulated prices throughout construction. Economical management of materials may result in substantial reducing in project prices.

1.4 Aim

To understand about the problems occurring in the organization because of improper application of material management.

1.3 Objectives

1. To analyze the factors that affects the loss in production.
2. To suggest method for a smooth flow of materials thereby improving the efficiency of material management.

3. To plan and implement various efficient material handling and logistics technique for the reduction of time delay.
4. To check the feasibility of right product at right time in right quantity with specification rightly suited to customers.
5. To find out different ways of production planning and control to contribute to the profit of enterprise.

2.Literature Review

Prof. Chetna M. Vyas and Khyomesh V. Patel, construction materials management on Project sites, Gujarat, INDIA, 2011.

Materials costs money in terms of storage space, equipment, personnel, insurance, deterioration, obsolescence and, above all, the cost of the capital required in financing stocks. On the other hand, it costs money to run out of stocks-idle wages, loss of production, loss of profit and expediting to overcome the disorganization following a shortage. The organization has maximum percentage of its capital tied up in stock. There are also Expenses related of enhancing and maintaining inventories. The monthly expenses of raw Materials add up to 80% of the company's total monthly expenses. This illustrates the importance of materials and site material management and raises the following questions among the top management of the company. Is the inventory managed with the aim to obtain the ideal inventory level? Are effective and efficient Inventory policies in place? We are going to deliberate the aspects as applicable to the construction project as Major expenditure incurs in raw materials, consumables, spare parts of equipment, Wastages and if they are properly checked from time to time the expenses can be reduced substantially. Thus material management on construction site is of at mainly importance.

SK. Nagaraju and B.Sivakonda Reddy, Resource Management in Construction Projects a case study, 2012.

This construction Project refers to a high stake finish aiming at time sure planned performance objective. Unless matching resources are planned and procured, No activity will be dead in keeping with a prefixed time schedule. Project managers should take advanced choices beneath totally different planning wants (such as swish resource utilization profiles and resource constraints) and beneath conditions of uncertainty that typically extend on the far side task durations. That the study within the paper deals with resource planning for a quick track project with forced durations.

DEEPAK M.D, Construction Engineering and Management, Report submitted to Manipal University in partial fulfilment of the requirement for the award of the degree, July 2015

This project thesis titled 'An empirical case study of fabric Management in Residential Project' is an endeavor created on learning and assessing the fabric management principles and practices during a residential project. The target of this study is to grasp concerning the issues occurring within the organization as a result of improper application of fabric management. In construction project operation, usually there's a project value variance in terms of the fabric, equipment's, manpower, contractor, overhead value, and general condition. Material is that the main element in construction comes. Therefore, if the fabric management isn't properly managed it'll produce a project value variance. Project value will be controlled by taking corrective actions towards the value variance. Thus a technique is created to classify the materials by rudiment analysis and these materials square measure known and square measure haunted to live the variations concerned by S-Curve analysis and appropriate measures square measure prompt victimization cause and impact diagram. This helped to counsel the foundation causes for several forms of issues that were detected at the project website.

A. R. Patil and S. V Pataskar, "Analyzing Material Management Techniques on Construction Project," vol. 3, no. 4, pp. 96-100, 2013.

Made the study that shows the effective coming up with of materials before the execution of the project. It additionally provides stress on internal control technique like basics analysis. This paper additionally explores this practices of fabric Management and therefore the study is conducted in 2 phases, 1st section provides the Qualitative info relating to deviation in planned and actual materials in terms of S curve analysis mistreatment MSP tool and reasoning over the deviation is crucial to grasp the impact of fabric coming up with before execution of project. Numerous causes on the S curve analysis have been given in terms of issues. These major reasons of variations are sorted, classified and mentioned. It additionally highlights factors for maintaining material stock during a shorter length of your time. To take care of AN optimum level of inventory, internal control technique like basics analysis is carried go in second section of study to beat the issues.

S. Charles, "Study of optimization of construction projects by effective practices of material management," vol. 5, no. June, 2003.

Has conjointly created a trial to study the fabric management practices and techniques being adopted at Ceebros Garden construction project in Madras. To value the practices at web site with the general material management principles associated to counsel the

practices and techniques that can improve the management of fabrics at this project thus on have an improvement all told the aspects of material management. The study doesn't embody non-consumable material things for its study and also the period of the study was restricted.

R. K. Anusha, "Material management- a case study of a commercial complex," no. May, 2012.

This analysis describes regarding the fabric secret writing and Material demand coming up with enforced on a residential project. It additionally offers stress on rising the fabric storage potency within the project web site. The study doesn't embody the study of non-consumable things and the work has been disbursed for a restricted length. The end result of the work doesn't offer the rigorous study of every and each item of the project, however solely few major things is taken into account for the analysis.

C. Bordat and B. G. McCullouch "An Analysis of Cost Overruns and Time Delays of INDOT Projects," pub no.: FHWA/IN/JTRP, December 2004.

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3. Methodology

The research methodology adopted to achieve the targeted aim, started with the literature survey, setting up of aim, objectives.

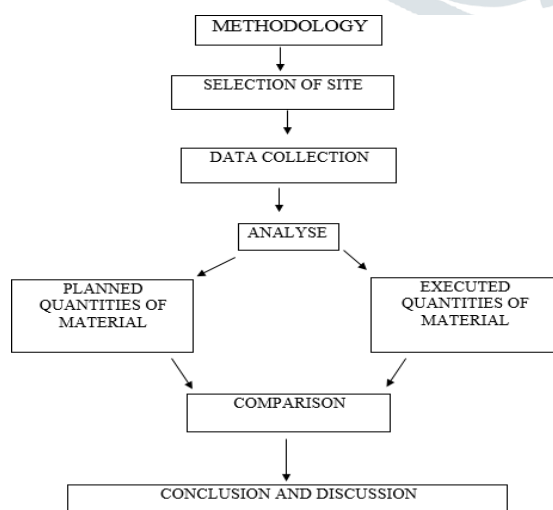


Fig.1 Flow Chart of Methodology

3.1 Material logistics plans on site:

It was studied that from the above mentioned different material logistic plan.

Onsite market place is been used on the site. In this all the materials and equipment required by different sub-contractors on site are been stored at one place in one store.

- **Components of material management are:**
- Material estimation, budgeting, designing and programming.
- Scheduling, purchasing and procurable Receiving and scrutiny.
- Internal control, storage and reposting.
- Material handling and transport Waste management.

3.2 Objectives of Materials Management

1. To analyze the factors that affects the loss in production.
2. To suggest method for a smooth flow of materials thereby improving the efficiency of material management.
3. To plan and implement various efficient material handling and logistics technique for the reduction of time delay.
4. To check the feasibility of right product at right time in right quantity with specification rightly suited to customers.
5. To find out different ways of production planning and control to contribute to the profit of enterprise.

To fulfill all these objectives, it is necessary to establish harmony and good co-ordination between all the employees of material management department and this department should have good co-ordination with the other departments of the organization to serve all production centers.

3.3 Project Management

Special coaching sessions ought to be arranged on website to update the staff concerning the newest techniques. Plant and machinery ought to be updated often so as to avoid any break down. Workers and contractors ought to be radio-controlled for proper methodology to execute a particular task. Regular check ought to be unbroken on designing thus on overcome any error. Proper supervising ought to be done on website to boost the extent of accomplishment. Taylor (1913) known that the economic losses caused by material waste are smaller than those associated with the unskillfulness of human work. Ford (1927) jointly instructed that human work ought to be the

main focus of waste convention since the worth of materials depends, to a great extent, on the work that has been spent on them. Berliner B. says project management in several firms is predicated totally on money performance measures that tend to be backward targeted and don't create it simple to trace operational prices.

3.3 Planning

Planning the foremost unremarkably used basis for coming up with things out for the project is that the BOQ ready by the shopper. Corporations might have 2 major levels in planning- small and macro level. Time, cost, material and labor square measure the four major types of coming up with undertaken on sites. The look ought to be revised as oft as possible so as to observe whether or not work is progressing as planned.

3.4 Purchasing

Purchasing procedure can be described as below:

- Step one – Material Indent
- Step two – Enquiry to venders
- Step three – vender Comparison
- Step four – Vendor choice and Negotiations
- Step five – commercial document Step half-dozen – vender analysis

3.6 Inventory Control

“The total of the worth of raw materials, fuel and lubricants, spare elements, maintenance consumables at any given purpose of your time.” internal control, conjointly known as stock management, is the process of managing a company's inventory levels, whether or not that be in their own Warehouse or adjoin alternative locations.

It includes management of things from the time you have got them available to their final destination (ideally to customers) or disposal (not ideal). A list system also monitors their movement, usage and storage. Internal control means that managing your inventory levels to confirm that you simply ar keeping the best quantity of every product. Correct internal control will keep track of your purchase orders and keep a functional provide chain. Systems may be place in situ to assist with prognostication and permit you to line reorder points, too.

4. Data Collection

4.1 Case Study on Sarthak Venture

This case study is taken on project name Sarthak venture which is located in khadi machine kondhwa pisoli road.

Following table shows the information about the project.

Sr.No.	Materials	Supplier
1.	Crush sand, 20mm metal, and 10mm metal.	Ranjeet Supplier
2.	Steel	Hemi Steel supplier
3.	Brick fly ash6”	K.G. Bricks
4.	AAC Blocks	Viraj casting PVT.LTD.
5.	4” Red Bricks	Om sales Corporation
6.	Cement (OPC 53 Grade)	Kalburgi Cement PVT.LTD.

Table No.1 Project Attribute

4.2 Information of supplier

Project name	Sarthak venture
Address	S.No.32/5A/2(part), wagh Nagar ,near khadi machine kondhwa pisoli road, pune-411060
Building Type	Residential
Name of Client	Vikram chavhan
Name of Contractor	RCC WORK-PHJ infrastructure and facilities Brick work-S.D.PANCHAL
Construction started	11/05/2018
Expected Date of Completion	22/11/2022
Total cost of Project	17.5 crore
Numbers of floors	14
Numbers of Wings	1
Name of the Project Incharge	Vinod kundalkar
Project status	Under Construction

Table No.2 Information of supplier

4.3 Inward Register

Stock book is maintained for classifying all the materials registered in the inward Book in to different categories. Different stock books and some material registered in them are as follows.

- 1) Hardware stock book: centering oil, paint brush, wonder tape, fawda, ghamela, nails etc.
- 2) .Machines stock book drill machine, grinder vibrator etc.
- 3) Safety material stock book: hand gloves, helmet, jacket, nylon rope, gum boots, brigade tape, etc.
- 4) General stock book: office stationary, white board, chair, table, toilet accessories, cooler accessories, ac accessories, etc.
- 5) Electric material stock book: cable, player, wooden board, sockets, MCB, ELCB, etc.

- 6) Centering material stock book: props, spans, vertical, horizontal, plywood, etc.

Inward Stock Book			
Supplier name	Description	Chalan no.	Date
Kashiram industries ltd.	OPC 53 Grade, Birla shakti cement 200 bags of 50 kg	-	-
Ranjeet Suppliers	Course aggregate 20mm cft	2139	31-01-2020
Viraj casting pvt.ltd.	ACC Block 6" 1161nos	7778	01-02-2020
J.D stone and marble	Steelgray Granite 36"X3" 306 nos 24"X3" 308nos	713	01-02-2020
Om sales corp.	Red brick 4"- 9140 nos	1379	03-02-2020
kesoram industries	OPC 53 Grade, Birla shakti cement 100bags of 50 kg	-	03-02-2020
Ranjeet suppliers	Sand Crush 520 cft	2140	04-02-2020
Ranjeet suppliers	Course aggregate (20 mm) 600cft	2141	04-02-2020
Kalburgi Cement pvt.ltd.	OPC 53 Grade, Birla shakti cement 150 bags of 50 kg	-	04-02-2020
Hamy steel pvt.ltd.	Binding Wire 50kg	2185	05-02-2020
Ranjeet Suppliers	Crush sand 305 cft	2143	06-02-2020

Table No.3. Inward Stock Book

Month	Planned Quantity (Cubic Meter)	Total Quantity to be executed (Planned + balance)	Executed Quantities (Cubic meter)	Balance
Sept.2018	857.6	849.7	798.3	51.4
Oct 2018	785.1	752.9	660.8	92.1
Nov.2018	789.5	741.1	615.7	125.4
Dec 2018	790.8	730.2	621.5	108.7
Jan 2019	780.3	736.2	623.3	112.9
Feb 2019	570.5	328.1	285.4	80.3
Mar 2019	112.9	82.2	64.2	18
TOTAL	4686.7	4220.4	3669.2	588.8

Table No.4 Planned and executed quantity of concrete

Month	Planned Quantity (Cubic Meter)	Cement	Crush sand	20 mm Aggregate
Sept.2018	307.22	440.00	40	35
Oct 2018	279.52	200.00	35	28
Nov.2018	252.95	500.00	25	8
Dec 2018	237.46	200.00	36	10
Jan 2019	188	520.00	50	16
Feb 2019	184.75	520.00	32	30
Mar 2019	277.83	440	28	20
TOTAL	<u>1727.73</u>	<u>2820</u>	<u>246</u>	<u>147</u>

Table No.5 Month wise Material consumed for planned quantities of concrete

5. Conclusion

1. After analyzing the various factor that affects production loss in terms of time and money due to insufficient material management it is bound that list distance and skilled labors are very important factors.
2. Reduction of time in material handling and logistics by using various efficient method of transportations. The logistics service and technique earlier these are they words would increase the efficiency and productivity of management.
3. By adopting proper management with experienced site manager and skill labor for the selected study area site, it is formed out that overall delay can be reduced by two to three months from eight to nine months also wastage of material can be reduced to 5% to 10% from 20% to 25%
4. It is suggested that by using flow method, mass production method for production planning will saved time and cost leading to enterprise profit.

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