

A Review on Analysis of Production Loss in Terms of Time and Money Due to Insufficient Material Management

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Abstract: There are several technique of management ought to be taken in envisage to improve a capability of construction management and productivity of labor. Persistently there has been delay of fabric received through material provider agency because of several nominal reasons. It may be solved by many various techniques of transitions. Analyzing all the delay from work activity of sure month of your time. Recording all the fabric ordered, material received from agency, the work has been dead at their activity time. Hard and making material record. To managing a productive and cost economical website economical material management is very essential. Analysis has shown that construction materials and instrumentation might constitute quite seventieth of the entire value for a typical construction project. Thus the correct management of this single largest part will improve the productivity and price potency of a project and facilitate guarantee its timely completion. One of the main issues in delaying construction projects is poor materials and instrumentation management. This paper describes the most results of survey administrated in Ahmedabad that investigated the fabric management of three well-known builders of Ahmedabad.

Keywords: Construction materials, Cost control, Materials management.

1. Introduction

Materials management may be a method for designing, executing and dominant field and workplace activities in construction. The goal of materials management is to insure that construction materials area unit on the market at their purpose of use when required. The materials management system tries to insure that the correct quality and amount of materials area unit appropriately elite, purchased, delivered and handled on site during a timely manner and at an inexpensive price.

Materials management is that the system for designing and dominant all of the efforts necessary to confirm that the proper quality and amount of materials area unit properly per a timely manner, area unit obtained at an inexpensive price and most importantly area unit on the market at the purpose of use once needed. Thus Materials management is a crucial part in project management. Materials represent a serious expense in construction, thus minimizing acquisition prices improves

opportunities for reducing the project prices. Poor materials management may result in enhanced prices throughout construction. Economical management of materials may result in substantial savings in project prices. If materials area unit purchased too early, capital could also be delayed and interest charges incurred on the surplus inventory of materials. Materials might deteriorate throughout storage or get purloined unless special care is taken. Delays and extras expenses may be incurred if materials needed for specific activities area unit untouchable. Making certain a timely flow of materials is a crucial concern of fabric management. For effectively managing and dominant materials, the performance of materials management ought to be measured.

A performance live calculates the effective operating of a function. These performance measures might disagree from system to system. The measures divide the materials management system in elements and create the operating of the system additional economical. Once joined, the measures create the complete materials management system.

A. Material Management

Material management may be outlined as a method that coordinates coming up with, assessing the necessity, sourcing, purchasing, transporting, storing and dominant of materials, minimizing the wastage and optimizing the profitability by reducing price of fabric. Building materials account for sixty to seventy % of direct price of a project or a facility, the remaining 30 to 40% being the labor cost.

B. Need for Study

Site material management could be a method for dominant field and workplace activities on Construction web site associated with the materials. The web site the location the positioning. Material management system tries to insure that the proper quality and amount of materials are suitably delivered and handled on site in a very timely manner. Designing and dominant all of the efforts necessary to make sure that the right quality and amount of materials are properly laid out in a timely manner and most significantly are offered at the purpose of use once needed. So web site material management is a vital part in

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Project management. A material management is that the system that represents a serious Expense in construction, thus up web site material management improves opportunities for reducing the project prices. Poor management may result in exaggerated prices throughout construction. Economical management of materials may result in substantial savings in project prices. Materials could deteriorate throughout storage or get purloined unless special care is taken. Delays and extras expenses could also be incurred if materials needed for specific activities are inaccessible. Guaranteeing a timely flow of materials is a vital concern of web site material management. For effectively managing and dominant materials, the performance of web site materials management ought to be measured. Therefore, there's would like of study during this field of web site material management to avoid the higher than factors. there's heap of labor done on material management however the subject web site material management specifically needs to be centered as a result of it itself consists of the many responsibilities and activities which might be improved for overall advantage of the development project.

C. Components of material management are

- Material estimation, budgeting, planning and programming.
- Scheduling, purchasing and procurement
- Receiving and inspection.
- Inventory control, storage and warehousing
- Material handling and transport
- Waste management

D. Objectives of Material Management

1. To analyze the factors that affects the loss in production.
2. To maintain 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 ensure the production 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

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

This paper is written of unwell avoid created by the absence of correct materials management on construction sites. To managing a productive and price economical web site economical material Management is extremely essential. Analysis has shown that construction materials and instrumentality could represent over seventieth of the whole price for a typical construction project. so the right management of this single largest part will improve the Productivity and price potency of a project and facilitate guarantee its timely completion. one in all the key issues in delaying construction

comes is poor materials and instrumentality Management. This paper describes the most results of survey disbursed in Ahmedabad that investigated the fabric management of three documented builders of Ahmedabad.

Khyomesh V. Patel, Chetna M. Vyas -construction materials management on project sites.

To managing a productive and cost economical website economical material management is very essential. Analysis has shown that construction materials and instrumentality might constitute quite seventieth of the overall price for a typical construction project. so the correct management of this single largest part will improve the productivity and value potency of a project and facilitate guarantee its timely completion. One of the main issues in delaying construction projects is poor materials and instrumentality management. This paper describes the most results of survey dole out in Ahmedabad that investigated the fabric management of three wellknown builders of Ahmedabad.

Calistus Ayegba, An Assessment of Material Management on Building Construction Sites, 2013.

The paper considers the management of materials on building construction sites. within the study, technique of fabric procurance apply on construction website, factors touching material management on building construction website still as causes wastages on construction sites were determined. Findings reveal that, thirty first of respondents organization procure materials for websites by head workplace provisions while not site requisition, sixty fourth of respondents organization procure materials for site by head workplace provisions with site requisition and five-hitter of respondents organization procure materials for sites by through direct purchase by site manager or engineer.

T. Phani Madhavi, Steve Varghese Mathew, Roy Sasidharan, Material management in Construction -A case study, 2013.

The objective of the paper is to grasp concerning all the issues occurring within the company owing to improper application of fabric management. a strategy is employed to diagnose and judge the procured method concerned in material management and launch a nonstop improvement was developed and applied. An intensive study was allotted at the side of study of cases, surveys and interviews to professionals concerned during this space.

Arunprakash N. and Nandhini N, Study on Stock Management Practices in Construction Companies Department of Civil Engineering, Kongu Engineering college, Perundurai, India.

In this paper the main objective of the study is to analyze the inventory control practices adopted by the construction companies. This analysis is based on the primary and secondary data. The main source of primary data is by conducting question survey and the source of secondary data is published Annual Report and stock sheet of the company.

S. K. 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 square measure planned and procured. No activity

will have been dead in keeping with a prefixed time schedule. Project managers should take complicated choices below totally different programming wants (such as swish resource utilization profiles and resource constraints) and below conditions of uncertainty that typically extend on the far side task durations. That the study within the paper deals with resource programming for a quick track project with affected durations.

3. Methodology

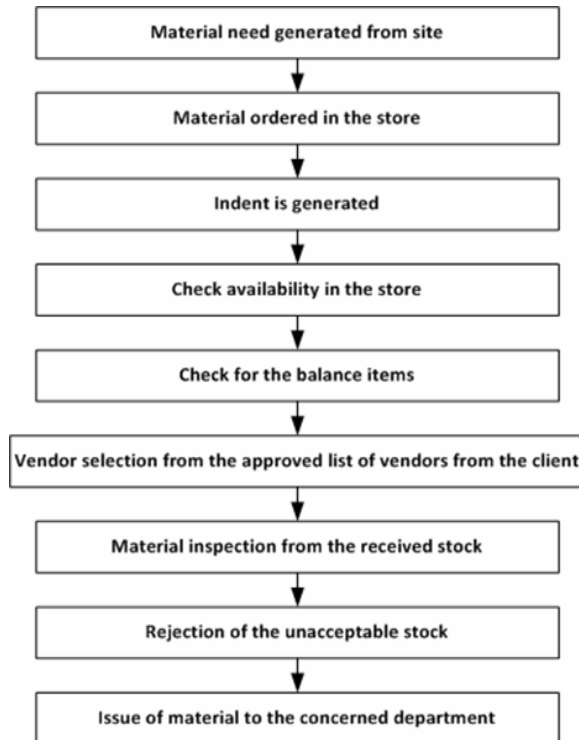


Fig 1. Process of material management

Functions of Material Management:

The functions of materials management area unit mentioned below:

In order to meet the objectives of materials management as stated on top of to fulfill the essential objectives and goals, the functions of the materials management also are classified as primary and secondary functions.

a) Primary Functions:

To meet the first objectives, the first functions of the materials management area unit given as follows:

- Materials needs designing (MRP)
- buying
- Inventory designing and management
- Ascertaining and Maintaining the Flow and provide of Materials
- internal control of Materials
- division potency

b) Secondary Functions

- Standardization and Simplification
- build and obtain selections
- writing and Classification of Materials

- prediction and designing

A. Project Management

Special coaching sessions ought to be organized on website to update the staff relating to the most recent techniques. Plant and machinery ought to be updated frequently so as to avoid any break down. Staff and contractors ought to be guided for proper methodology to execute a selected task. Regular check ought to be unbroken on coming up with therefore on overcome any error. Correct superintendence ought to be done on site to boost the amount of acquisition. Taylor (1913) pointed out that the economic losses caused by material waste square measure smaller than those associated with the unskillfulness of human work. Ford (1927) conjointly prompt that human work should be the main target of waste convention since the worth of materials depends, to a good extent, on the work that has been spent on them. Berliner B. says project management in many corporations relies totally on money performance measures, that tend to be backward centered and don't make it simple to trace operational prices.

1) Planning

The most normally used basis for coming up with things out for the project is that the BOQ ready by the consumer. Companies may have two major levels in planning- small and macro level. Time, cost, material and labor are the four major types of coming up with undertaken on sites. The design ought to be revised as often as potential so as to watch whether work is progressing as planned.

2) Purchasing

Purchasing procedure can be described as below:

- Step 1 – Material Indent
- Step 2 – Enquiry to Vendors
- Step 3 – Vendor Comparison
- Step 4 – Vendor Selection and Negotiations
- Step 5 – Purchase Order
- Step 6 – Vendor Evaluation

3) Receiving

System can be divided into:

1. Receipt from outside suppliers
2. Receipts from internal divisions.

System of receipt starts even before the fabric reaches the site. The three documents that ought to be sent are copy of commercial document, supplier's recommendation document and therefore the consignment note. This permits the Stores manager to organize and set up for clearances of materials. For receipt from internal divisions, typically transfer notes and come back to stores documents are used.

4) Inspection

Inspection will happen in two ways in which

1. Pre- dispatch scrutiny
2. Scrutiny on website

It is the responsibility of the inspector to examine all materials delivered to the location before their getting used within the work. It fascinating to perform scrutiny of materials or fabricated product before their delivery at website. E.g.: precast members. The inspector shall have rights to reject faulty material and have it off from website. With respect to

manufactured product, the standard needs ought to be specified in the acquisition order.

Methods of scrutiny

There are 3 strategies of inspection:

1. Visual
2. Tactile
3. Applied mathematics

5) *Issuing Material*

According to Sundersan, M. problems is divided into

1. Problems to overwhelming departments
2. Problems to outside suppliers for process or conversion.

Issuing on web site doesn't happen within the case of all construction materials. Within the case of sand or combination, the materials square measure consumed as and once needed corresponding to the progress of the project. For alternative materials, issues are based on production programs. Supported this and therefore the bill of materials, work orders square measure written, listing for every material, amount to be issued against every part requiring that material. This mechanically controls consumption.

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.”

4. Case Study

Name of the organization	BEIL (Bakeri)	Savvy infrastructure	JMC
Designation	Store keeper, Project Managers	Purchase manager, Project Managers	Store keeper, Project Managers
Types of work undertaken by the company	Residential, Commercial buildings etc.	Infrastructure projects, commercial buildings etc.	Infrastructure projects, commercial buildings etc.
Year of establishment	1959	1991	1990
Head office	Ashram Road, Ahmedabad	S.G. Highway, Ahmedabad	Ambavadi, Ahmedabad

By grouping knowledge for materials management through a questioner from on top of mentioned accepted corporations of Ahmedabad following square measure issues in materials management.

Phase 1: Materials Identification

Problem	Description
Undefined scope	No good definition of what is wanted
Lack of communication	Lack of communication between parties involved
Incomplete drawings	Plans are not completed and details are missing
Lack of conformance to requirements	What is wanted by the customer is not what is prepared
Nonstandard specifications	Use of specifications that are not commonly used
Incomplete / ineffective meetings	Issues not resolved during meetings
Difference between plans and specifications	Don't communicate exactly what is wanted to suppliers

Phase 2: Vendor Selection

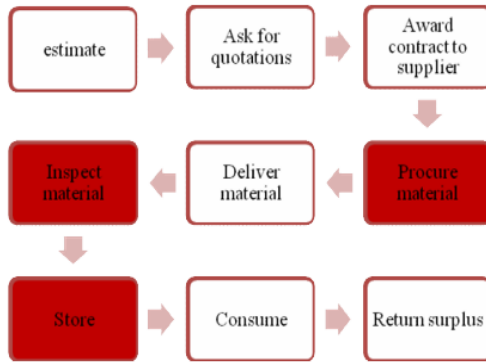
Problem	Description
Uncontrollable bid list	Have too many suppliers and too little information
Incomplete proposals	Suppliers do not include all documents required
Time spent in investigating non qualified suppliers	

Phase 3: Procurement Problem

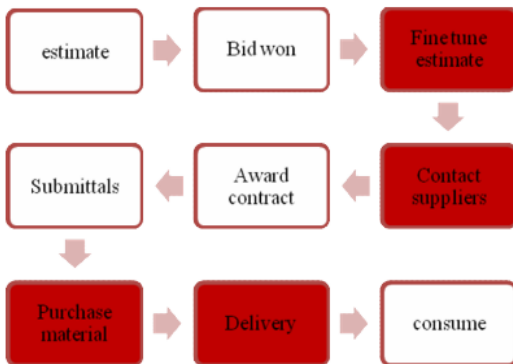
Problem	Description
Availability of material	
Availability of quantity	
Matching price to competitor's price	Price reduction to match competitor's price
Late deliveries	Materials are not delivered as per schedule
Late or incorrect submittals	
Poor communication	Lack of communication between parties
Lack of conformance to requirements	What is wanted is not what is prepared
Unrealistic delivery dates	Delivery dates impossible to meet
Vague stated requirements	Lack of communication
Re handling of materials	Materials to be moved from one place to another
Storage of materials	Storage areas are limited or are far from working area
Theft	
damaging	Damage during handling or other conditions

Phase 4: Construction Phase

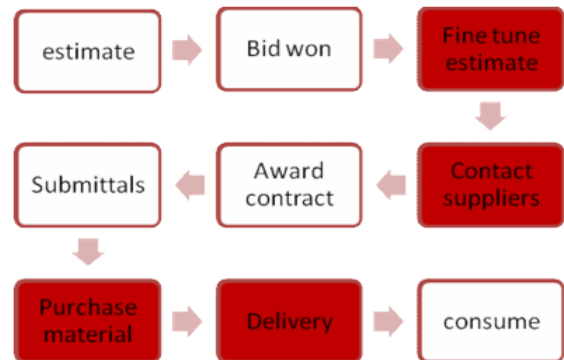
Problems	Description
Incorrect type of material delivered	There are differences in material ordered and delivered
Incorrect sizes delivered	
Incorrect quantities delivered	
Keeping track of material	Don't know where materials are at a certain period of time
Rehandling of material	
Storage of material	
Loss of material	
Damage	
No supplier QA	No quality assurance from supplier
Poor communication	
Receiving, handling and storage of unused materials	

Material management flow – Contractor A

1. PM is responsible of the entire releases supported schedule.
2. Materials uphold IP system directly until the time they're consumed, no correct storage facility.

Material management flow – Contractor B

1. PM revises estimate and creates a listing of careful quantities for materials.
2. PM clarifies scope at the side of purchase department on site, no involvement of the top workplace.
3. Shopping for but calculable.
4. Delivery to web site directly.
5. No automation, lack of correct MIS, lack of coordination with different comes.

Material management flow – Contractor C

1. Purchase department and stores department operational as two entities, demand of a co-coordinating authority.
2. In house MIS gift, co-coordinating with central stores department.

5. Conclusion

1. There ought to be a centralized material management team co-ordination between the location and therefore the organization.
2. Correct management, pursuit and watching of the system are required.
3. Awareness and responsibility ought to be created at intervals the organization.
4. There's a requirement of associate economical MIS integration all aspects of fabric management.
5. Companies using correct material management system is seen to own raised their overall potency by 35%.

References

- [1] Acharya, Jitendra, Thesis Materials management for the construction sector, CEPT.
- [2] Agarwal, Anil. (2001), "Benchmarking wastage control of construction materials", NICMAR journal of Construction Management, Vol. 16, No. 1, January 2001.
- [3] Balva, Surbhi. (1997) Thesis, Material management in construction industry, CEPT.
- [4] Buffa, Elwood, Production inventory systems: planning and control.
- [5] Bhatt, Navjot Singh, Thesis, Material planning and control, CEPT.
- [6] Chandani, Kansara. (2007), "Identification of material wastage in residential buildings", NICMAR journal of Construction Management, Vol. 13, No. 1, January 2007.
- [7] Chandler, Ian, Material management on building sites.
- [8] Eduardo, L., "Material waste in building industry: Main causes and prevention", Journal of Construction Engineering and management, Vol. 12, No. 4, July 2002.
- [9] Gopalkrishnan, K., Sundersan, M., Material management.
- [10] Shah, K.C. (1993), "Material management", All India Council of Technical education.
- [11] Vaid, K. N. (1997), "Waste control of building materials in construction of mass housing projects", NICMAR journal of Construction Management, Vol. 2, No. 3, January 1997.
- [12] Ward, Wendy, "Resource management", Concrete Construction, January 2006.