Study on Labour and Material Management in Construction Industry

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Abstract - Material management is a vital part of the construction business. As a result, companies must grasp how proper materials management strategies affect the efficacy of project execution. A correctly executed materials management program may ensure the timely flow of goods and equipment to the jobsite, allowing for better work face planning, enhanced worker productivity, more efficient scheduling, and lower project costs. Materials management is an important function that helps to increase productivity in building projects. Material management functions are defined as planning and material take-off, vendor evaluation and selection, purchasing, expenditure, shipping, material receiving, warehousing and inventory, and material distribution. In this project, we produced a material management scheme for the building project, as well as conducted an industry survey to determine the various formats for construction material management.

1. Introduction

Materials for construction are a crucial cost component in any construction project. The entire cost of installed material could be 50% or more of the overall cost.[2] The purpose of material management is to make sure that materials are available at their place of use when needed; therefore, efficient material procurement plays an important part in the successful completion of the work. Materials management is a vital part of the construction business. Accordingly, industries must grasp the effects of proper materials management strategies on the efficacy of project implementation.[6] Several books and papers criticize the building industry's inefficiency and productivity. Construction projects are frequently delayed, over budget, and subject to litigation. A correctly executed materials management program may ensure the timely flow of goods and equipment to the the site, allowing increased work face arranging, enhanced worker efficiency, better scheduling, and lower project expenses.

1.1Material Management

Material management is a vital part of the construction business. As a result, companies have to understand how proper materials management strategies affect the efficacy of project execution. A correctly executed storage and distribution system may ensure the prompt delivery of goods and equipment to the jobsite, allowing for better work site planning, enhanced staff efficiency, more efficient scheduling, and lower cost of the project. Materials handling is an important function that helps to increase performance in building activities. It defines material management activities as planning and material take off, vendor evaluation and selection, purchasing, expenditure, shipping, material receiving, warehousing and inventory, and material distribution. Managing materials is a vital role that contributes to improved efficiency in building operations. It describes material management tasks such as planning and material take-off, vendor evaluation and selection, purchasing, expenses, shipping, material receipt, storage and stock, and delivery of materials.

2. Literature Review

Muleya & Kamalondo (2017) Material management is also defined as an integrated process of designing, constructing new structures, or re-modelling current ones, and

using materials effectively, with the goal of improving the efficiency of the construction industry and resolving material waste management issues. A number of researchers from different regions of the world have demonstrated that material waste from the building firm constitutes a pretty substantial percentage of the production costs. (Saidu & Shakantu, 2016). Improper material management increases the overall cost of construction endeavors. (Ameh & Itodo, 2013). Materials administration is a technique that integrates planning, evaluating the needs, finding, buying, transporting, storing, and regulating of materials, minimizing waste and improving profitability by lowering material costs. (Phu & Cho, 2014). Managing construction materials is a novel trend in the construction business. (Harris & McCaffer, 2013). In the current environment, management and designers focus mainly with how to limit costs, with no attention on material management techniques. (Wahab & Lawal, 2011). Overall, it is believed that the cost of materials accounts for a significant proportion of the total cost of construction projects. (Kerzner, 2013). As a result, crucial material management should be implemented on-site. As stated by Adafin, Daramola & Ayodele (2010) Construction material administration is critical to the development of the construction sector.. Ajayi et al (2017) Construction material management is defined as lowering the amount and environmental impact of material waste generated by limiting the amount of materials consumed in a project.

3. Material Management

Material management is nothing more than an appropriate group managing material waste from known sources. Some of these sources include increased consumption of material as well as environmental challenges that produce a scarcity of materials.

3.1Process Of Material Management

The material management process begins with a need established on-site, which is then communicated to the store department, where the material is ordered and an indent is generated. The choice of vendors will be carried out for the least expensive and greatest items. Materials are brought in in the store section and inspected.

The investigation includes both practical and theoretical aspects of the ideas. As a result, the current work was divided into the following categories.

- Analysis of site and management.
- Analysis of inventory controlling.
- Analysis of purchasing procedures
- Analysis of Procurement and Tracking
- Analysis on Costs

3.2Labour Management

The survey is conducted using questionnaires issued to respondents involved in managing various types of building projects at BBCL HAASHIKA in Nungambakkam, Chennai. They are project managers, site engineers, and contractors. They work for the building company BBCL HAASHIKA. To analyze and rank the elements from three respondents, the Relative Important Index (RII) method is employed. Based on these findings, the degree of agreement among the groups of respondents on the ordering of factors is calculated using the H test, also known as the Kruskal-Wallis test, a type of nonparametric statistical test. Based on these findings, the degree of agreement among the groups of respondents on the ordering of factors is calculated using the H test, also known as the Kruskal-Wallis test, a type of nonparametric statistical test.

Figure.1.Labor Management

1. Labour Management Functions Affect on Project Time, Cost and Quality

- Manpower Planning
- Recruitment
- Selection
- Training and Development
- Motivation

2. Manpower Problems by Shortcoming of Labour Management Practices

- Low amount of payment
- High labour turnover
- Shortage of skill labour
- Labour lack of time respect
- Lack of education
- Don't use safety equipment's in work
- Communication problem with migrated workers
- Poor skill of the workers
- Lack of safety knowledge and training
- None have interest in work
- Poor team work
- Don't obey the rules and regulations
- Poor labour managements
- Poor skill to use construction materials
- Absence of workers at site
- Difficult recruitment workers
- Misunderstanding between workers
- Lack of Labour Safety
- Inadequate Training

3. Factors on Increasing Labour Productivity by Good Labour Management Practices

- Good management of the workers
- Good working disciplines
- Satisfaction at work
- Recognizance to labour
- Facilities at workplace
- Good relation with working community
- Good relation between labours and supervisors
- Bonus
- Good health and safety conditions
- High amount of payment
- Stability of works
- Health insurance
- Giving place for eating and relaxing
- Workers participation in descision making
- Injury insurance for workers
- Site near to home
- Creating Competition

4. Factors on Reducing Labour Productivity by Poor Labour Management Practices

- Poor skill workers
- The workers are not satisfied
- Working 7 days per week without taking a holiday
- Poor or no supervision method
- Poor management of project manager
- Misunderstanding between workers

4. Result And Discussion

4.1Materials

In the current case study, analysis on the work site was done with the existing knowledge of material management, and new methodologies were adopted on the work site, depending on the current construction scenario. The following issues were considered: the original site layout was modified, suitable management was brought in, and an entirely novel idea was developed. Comprehension of the issues that arise at the work place as a result of stock, buying, and the way materials are handled at the work site were taken into account. The case study as a whole was submitted to the Raviz Hills management system, and they were approved upon, as well as commitments were made to adopt these procedures for managing materials within 2 to 3 years for subsequent projects.

4.2Labours

Labour productivity is one of the least studied aspects of the Indian construction sector. Despite the time-consuming approaches. Work research and work measurement approaches can be helpful for collecting labor data and increasing labor efficiency. Highly trained workers is a factor that has a significant impact on labor efficiency since it allows work to be completed in less time while maintaining high standards. altering from partially skilled to trained workers, as well as changing the site layout, resulted in a 50% increase in labour productivity for reinforcement binding, as well as a 5 day reduction in time per floor and a labour cost reduction of Rs. 2400/- per floor,

resulting in a Rs.48000/- savings across the entire building. Work research and work methods of measurement are useful for collecting labor data and increasing labor productivity. This strategy helped to minimize labor costs by 20% each floor.

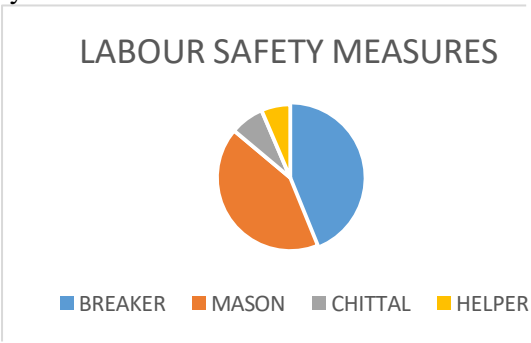

Figure.2.Labor safety measures

4.3Description Safety Measures

- This a pie chart of the basic safety measures used in construction sites, the categories are subdivided into Breaker, Mason, Chittal, Helper.
- On a detailed survey, the Mason has the highest safety measures compared to others.
- Meanwhile, the breaker who has more risk factors has low safety and chital and helper has a low safety.

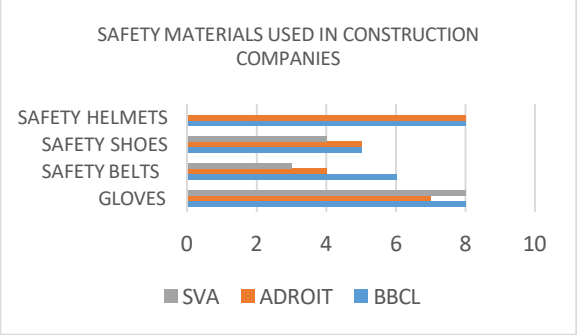

Figure.3.Safety materials used in construction companies

4.4Description Safety Measures

- This bar chart is for the safety materials used in different construction companies, the lists of companies were the survey taken was, BBCL, Adroit and SVA.
- The basic safety materials such as safety helmets, shoes, belts and gloves and taken in count for the survey.
- On a detailed survey, Safety helmets and gloves were widely used in the companies such as SVA and BBCL.

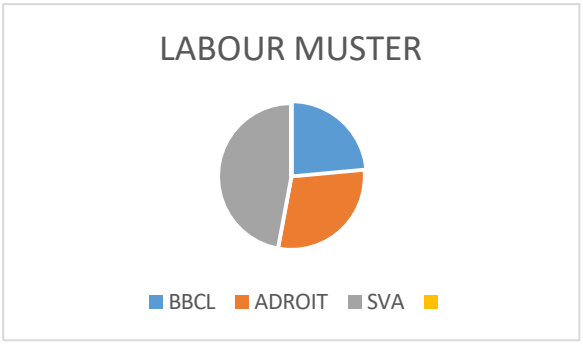

Figure.4.Labor Mustar

4.5Description (Labour Mustar)

- This pie chart is for the labour muster and their attendance maintenance, It is one of the important records for the maintenance.
- The survey was done with the same companies like BBCL, Adroit and SVA, On the detailed survey, BBCL maintains the muster properly.

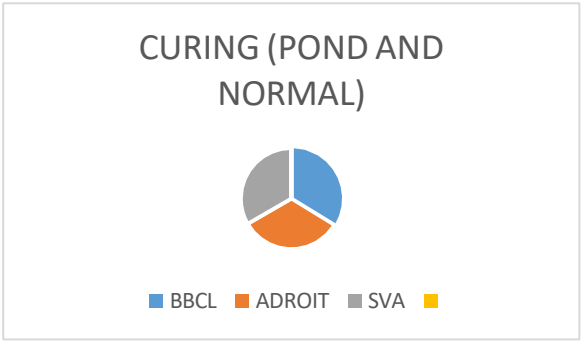

Figure.5.Curing

4.6Description (Curing)

- This Pie Chart is for the survey of curing process, post any concrete or plastering, The survey was done at the sites of BBCL, Adroit, SVA.
- From the survey it is clearly seen that, all the sites follows proper curing on time and on the detailed analysis, Pond curing is done immediately once after the entire concrete work is complete on the slab.

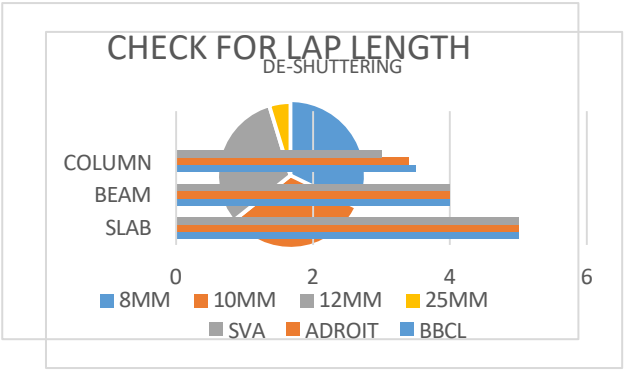

Figure.6.De-Shuttering

4.7Description (De-Shuttering)

- This bar chart is for the survey of De-Shuttering process, There are various DE shuttering done at the site, Some of them are for Beam, Column and the Slab.
- The DE shuttering for the slab is after 28 days and that is maintained properly on all the sites.
- The beam and column DE shuttering have given a low importance as per the survey.

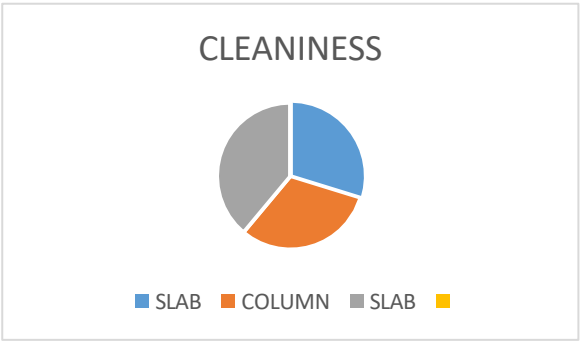

Figure.7.Cleaniness

4.8Description (Cleaniness)

- This pie chart is for the survey of Cleanliness maintained on the sites before the pouring of concrete, the major concrete works are slab, column and beam.
- On a detailed survey, it is said to be balanced on all the three sites, respective to cleanliness.

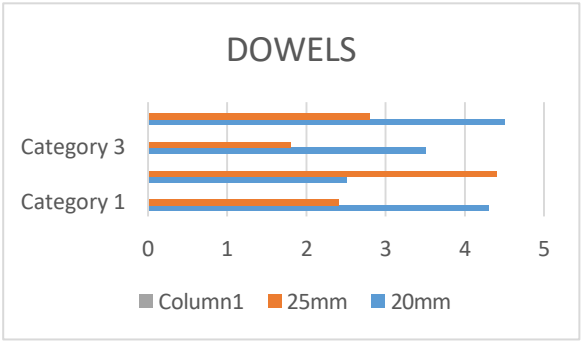

Figure.9.Dowels

4.9Description (Dowels)

- This bar chart is for the survey of the dowels left for extending the slab or the column.
- The dowels which were left were in the correct measurement and no extra dowels were left.

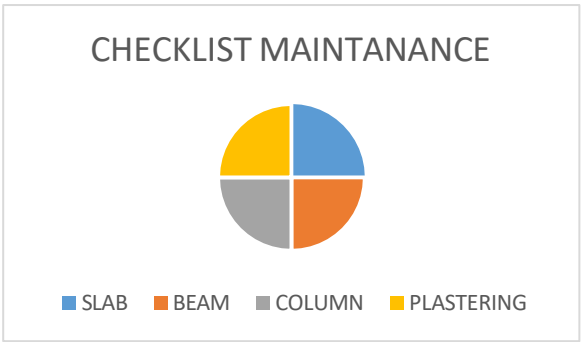

Figure.10.Checklist

Figure.8.Check for lap length

4.9Description (Lap Length)

- This pie chart is for the survey for the lap length check on the site for the addition of the rods.
- From the detailed survey, almost all the sites, maintains the proper lap length and there is no additional usage of materials.

4.10 Description (Checklist)

- This pie chart is for the survey of checklist maintenance, the checklist tracking was checked across for the beam, slab, column and plastering.
- The checklist is vigorously maintained on all over the sites properly.

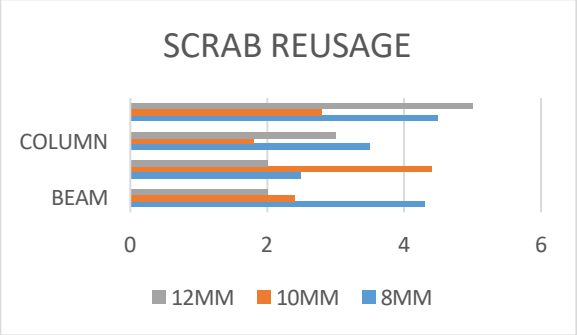

Figure.11.Scrab Reusage

4.11 Description (Scrab Reusage)

- This bar chart is for the survey of scrap usage, there are lots of diameters used on the bar bending process and they were recycled by the own client company for the further re- usage.

CONCLUSION

- Materials management strategies have a general beneficial effect on the handling of materials, resulting in increased efficiency and effectiveness on building sites.
- This is because inadequate construction material management has an impact on the project's general success in terms of cost, time, quality, and productivity.
- Materials management strategies increase the success rate of project planning and execution, cutting project costs. Furthermore, reducing material waste throughout the construction process is critical to avoiding financial loss.
- Material management practices should be properly planned to the start of a project carrying out and executed on every location and by every sector of the construction industry, whether large, medium, or small, to ensure timely project execution and standard work delivery within reasonable cost, time, and quality parameters.

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