

Effective Material Management to Minimize Problems in Building Construction Project.

Noor Rahman Stanikzai, Shalika Mehta



Abstract: Development material administration from the underlying stage to the development stage is the fundamental issue for the structure extends the expense of the undertaking increments when the arranging, controlling and coordinating of material is poor. To keep up the viable material administration to accomplish a convenient inventory of material and gear and to diminish the task cost and finish on schedule. This paper clarifies about the systems which are utilizing for stock control the board for development venture ABC analysis will be applied for four exceptionally affected materials by utilizing this method we will acquire economic development utilizing the S-CURVE strategy for the variety between arranged expense and genuine expense for material things however materials waste is the major problems in Afghanistan construction industry that has significant implications in both the proficiency of the business and the natural effect of construction project due to top material management.

Keywords: Construction Material, Project Management, Always Better Control Analysis, S-curve

I. INTRODUCTION

To oversee well the material are worried about Planning, examination, issue technique, stock control, buying, material inventory, transportation, material taking care of, material handling and data framework are the fundamental necessities. [1] Outlined the basics about material administration from beginning buy to the goal. It is designed to improve the coordination and control of different materials' exercises. The fundamental motivation behind any association is to make a benefit. Material is the focal thing and action of any association. It is considered as a way to accomplish better efficiency, which ought to be converted into cost decrease. [2] A significant issue that unfavorably influences the exhibition of development construction projects is the inappropriate treatment of materials during site activities. The improper taking care of and the board of materials on building destinations can seriously hamper project execution. [3]

Materials may weaken during capacity or get taken except if uncommon consideration is taken. Delays and additional costs might be brought about if materials required for specific activities are inaccessible. [4] The ineffectively overseen stock records can cause major issues for any industry. Material management keeps stock precise for the industry. The variance in the costs of things can be overseen by material management. Here and there the costs rise medium-term. The significant capacity of material management is to check the smooth progression of crude materials into the creation procedure without a lack of materials. It expands the effectiveness of laborers, lessens material out of date quality, better records and control and improves the nature of the item[5] The material-control work incorporates assurance of amounts, material procurement, and distribution. The goal is to buy materials in an opportune way to maintain a strategic distance from exorbitant work delays coming about because of delivery delays and non-accessibility of materials Bills of materials are converged with materials determinations to set up amounts and quality for requesting Field material control is required to design stockpiling and the issue of materials. [6] As per Ademorok (1999), material assets are the heart and life of any development industry. This is because the creation and circulation exercises, just as the general in the general execution of any development firm, will be flimsy on account of understocking or poor administration of materials. These materials if not appropriately oversaw will prompt poor execution of the construction project. [7]

II. PROBLEMS ASSOCIATED WITH MATERIAL MANAGEMENT

a) Unreliable Subcontractors.

Numerous contractual workers have issues finding solid subs for their employments. If you are when necessary and need to discover a sub, check with the materials providers and sellers that you work with routinely. They will have within scoop and may have an incredible proposal for a sub. You can likewise ask different subcontractors that you have worked with for a proposal, as well. Continuously check a sub's licenses, ensure they convey general obligation protection, and rundown your organization as extra guaranteed on their protection before you enlist them.

b) Planning

The most generally utilized reason for arranging things out for the project is the BOQ arranged by the customer. Organizations may have two significant levels in arranging a miniaturized scale and a large scale level.

Revised Manuscript Received on April 30, 2020.

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Time, cost, material and work are the four significant kinds of arranging attempted on destinations. The arranging ought to be reconsidered as every now and again as conceivable so as to screen whether work is advancing as arranged.

c) Scheduling

Scheduling can be precarious for even the most prepared development proficient. Once again, construction technology is answering this regular issue. Venture the board applications that you can access from a work area or your cell phone or tablet permit you to outwardly outline an undertaking course of events. Numerous applications take into account a "sticky note" style virtual load up that permits you to effectively observe what should be finished and gives real-time project status update.

d) Available Cash

You have payments because of subs, workers, merchants, materials providers, and equipment renter yet you don't get paid until the project is finished. What's more, except if you have enough accessible income, this can be a significant issue.

e) Document Management

Agreements, change orders, employment application, materials orders, insurance certificate, work applications, invoices and more you most likely have enough paper to fill a whole trailer of file organizers. It's a great opportunity to go paperless. An advanced arrangement can assist you with remaining on track of reports, sorted out on your project, and on-time with your payment. At the very least, check all reports into your PC and carefully record/sort out them. Make certain to back up your PC to cloud support or hard drive routinely on the off chance that you have a hardware issue.

III. METHODOLOGY

The construction industry has lots of changes are happening various techniques are used. After a visit to the construction site and collect information related to project and material management data is collected from a ground floor plus three-story hostel residential project which is undergoing in Jalalabad Daronta which is 15 KM away from the capital of Nangarhar province the hostel is for 284 students of four-story having 18 rooms per floor as per contract estimation it will take 12 months with a budget of 52,355,087.51 Afghani to complete the entire project. The major problem for the project is material fluctuation in the market, storage, and control of materials.



Fig 1. Show the overall methodology.

a) Data collection.

Table.1, shows the overall four types of materials quantity of the structure.

No. of floor	Cement Quantity in Bega	Sand Quantity in CUM	Aggregate Quantity in CUM	Bricks in No
Ground Floor	8609	640	770	219285
First floor	3452	264	215	219285
Second floor	4677	388	211	219285
Third floor	5601	407	374	219285
Total	22339	1699	1570	877138

Applying inventory control technique.

b) ABC analysis

ABC analysis is one of the inventory control techniques based on the items which represent the total material usage of inventory in the construction process. A-class items with very tight control and accurate records are generally 5% to 15% of items represent & 60% to 75% money spend of total inventory items B-class items with less tightly controlled and good records are generally 15% to 25% of items which represent 15% to 20% money spend and therefore last C-class items with the straightforward controls possible and minimal records are those items which are generally 65% to 75% of items represent 5% to 10% of cash value.

Percentage of materials For ABC analysis.

Table.2, Show the construction material which is used for the project the unit cost of materials annual demand for the building project, annual usage of materials and percentage of annual usage of each material.

Construction materials	Unit cost AFG	Annual demand	Annual usage AFG	The total annual usage in percentage
Cement	350	22339	7818692	63%
Bricks	3	877138	2631415	21%
Sand	700	1699	1189504	10%
Aggregate	500	1570	785000	6%
			12424611	100%

Classification of items according to ABC analysis

A-class items are generally 10% to 15% of items represent & 60% to 75% money spend of total inventory items.

B class items are generally 20% to 25% of items represent & 15% to 20% money value.

C class items are generally 60% to 70% of items represent & 5% to 10% money value.

- (A) Class material is Cement.
- (B) Class material is Bricks.
- (C) Class material is Sand and aggregate.

c) S-Curve analysis

S-curve analysis is a significant project management tool. This analysis is used for a correlation between the planned cost and actual cost for the material items. S-curve gives a perspective on project execution as far as cost and time.

Analysis of S-curve allows the project management team PMT to identify the project performance development, potential issues that could unfavorably affect the task if corrective action is taken.

IV. RESULT AND CONCLUSION

The below tables shows the overall quantity and cost four materials which are cement, brick, sand and aggregate table 7 shows the actual cost of material and quantity of ground floor plus three-story building for four materials figure 3 show S curve in percentage for materials figure 4 shows the S curve graph between the plane cost and actual cost for materials.

By carrying out of ABC analysis we have determined the materials cost and quantity of materials and found the complete expense of the materials. Proper control from initial phase to design phase of specific materials according to the schedule and timely procurement of materials from of each for every individual movement is conceivable by utilizing this technique. Also for difference between actual cost and plane cost S curve technique provided. increases in cost and budget because of some certain issues like unreliable subcontractor, planning, scheduling, available cash, document management, weather condition, natural climate and material fluctuation this would be sometimes give profit or loss to client or contractor. Here are some point to consider during construction project.

- Proper control tracking and evaluation of materials are required from the initial phase to the construction stage.
- There should be an incorporated material supervisory group coordination between the site and the company.
- The organization should use an efficient inventory control technique for the material.
- To find the value analysis in inventory always better control analysis should be done.

Table 3: Cost and Quantity of Cement

NO. of Floors	Quantity in KG	Begs calculation	begs	Rate	Amount
Ground Floor	430464	430464/50=8609	8609	360.00/	3099240
First floor	172590	172590/50=3452	3452	360.00/	1242720
Second floor	233838	233838/50=4677	4677	360.00/	1683720
Third floor	280064	280064/50=5601	5601	360.00/	2016360
Total	1116956	11169560/50=22339	22339		8042040

Table 4: Cost and Quantity of Sand

NO. of Floors	Quantity in KG	Cubic meter	Rate	Amount
Ground Floor	992466/1550=640	640	800.00/	512000
First floor	601400/1550=388	388	800.00/	310400
Second floor	409200/1550=264	264	800.00/	211200
Third floor	630742/1550=407	407	800.00/	325600
Total	2633902/1550=1699	1699		1359200

Table 5: Cost and Quantity of Aggregate

NO. of Floors	Quantity in KG	Cubic meter	Rate	Amount
Ground Floor	1232384/1600=770	770	600.00/	462000
First floor	343558/1600=215	215	600.00/	129000
Second floor	338088/1600=211	211	600.00/	126600
Third floor	598395/1600=374	374	600.00/	224400
Total	2512426/1600=1570	1570		942000

Table 6: Cost and Quantity of Bricks

NO. of Floors	Cubic meter	In 1 Cubic meter	No. of Bricks	Rate	Amount
Ground Floor	399	550	219285	4.00	877138
First floor	399	550	219285	4.00	877138
Second floor	399	550	219285	4.00	877138
Third floor	399	550	219285	4.00	877138
Total	1596		877138		3508553

Table 7: Total Cost and Quantity of G+ three Story Building.

Material	Cost	Unit	Quantity
Cement	8042040.00/	Bags	22339
Sand	1359200.00/	Cubic Meter	1699
Aggregate	942000.00/	Cubic Meter	1570
Bricks	3508553.00/	Numbers	877138
Total	13851793.00/		

Table 7 show the overall material used for the G+ three floor building its cost and Quantity the cost of all material like Cement, Bricks, Sand and Aggregate are 13691776.00/ Afghani. Among all material the cost of cement and brick is the highest.

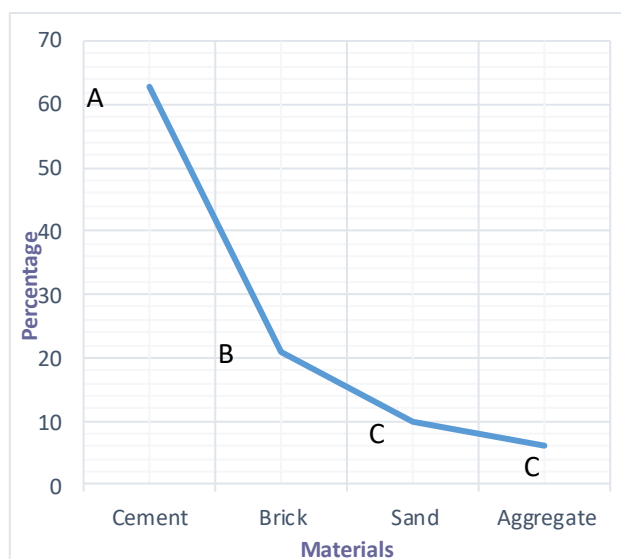


Fig 2. ABC analysis graph in percentage.

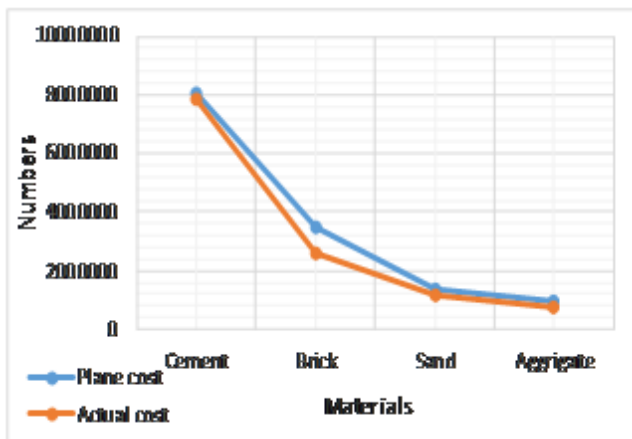


Fig 3. Plane cost & Actual cost.

V. CONCLUSION

Stock issues of excessively incredible or too little amounts close by can cause business failures. If an administration experienced stock out of critical inventory items, creation ends could result. Stock management demonstrates the wide structure of overseeing stock. The stock administration system is increasingly valuable in deciding the ideal degree of stock and discovering answers to the issue of security stock and lead time. Stock management has gotten profoundly evolved to address the rising difficulties in most corporate substances and this is in light of the way that stock is an advantage of unmistakable highlights.

ACKNOWLEDGMENT

I am researcher scholar of M.E Construction Technology & Management (CTM) at Chandigarh University. A research paper on Effective Material Management to Minimize Problems in Building Construction Project Is Based by my Own Work Carried out Review of My Study and under the Supervision of Shalika Mehta Assistant Professor at Chandigarh University.

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