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## Materials Management: an important Tool for Reducing Construction Cost

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### ABSTRACT

The paper identified materials management as an ingredient to reducing total construction cost since cost of materials account between 40% to 70% of the total cost of construction. Materials cost control activities are therefore, directed mostly towards selection, purchase, storage, and consumption of materials. It can also be very effective if it involves the cooperation of various departments such as: Purchasing, receiving and inspection, and stores, production and stock control department. The research also discussed storing procedure and materials cost price. Therefore, materials management is a function responsible for coordination of planning, sourcing, purchasing, moving, storing, and controlling materials in an optimum manner so as to provide predetermined services to the client at a minimum cost. Store keeper should be appointed on any construction site, the location and layout of stores should be decided very carefully to minimize multiple materials handling, materials brought to site should be accounted for on a daily basis.

**Keyword:** Material management, material cost and material cost control.

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### INTRODUCTION

It is no secret that large quantities of building materials are allowed to be buried or burnt each year as a result of inadequate controls on site (Johnson, 1981). According to the UK's Building Research Establishment (1976), 10 – 20% of all materials delivered to site either ended up as waste or were illegally removed during contract. This is probably a conservative estimate compared with the waste on many sites, particularly large scattered contracts such as housing development. Using UK Government statistics, it appears that more than 6 million tonnes of sand and an equal amount of aggregate were lost and no doubt some of this was removed illegally, but most of it was probably buried during the construction of external works on site.

Johnson (1981) highlighted that in 1976, 7 million square metres of concrete blocks either disappeared or were unaccounted for in site

valuations; and losses of plasterboard amounted to more than 11 million is frightening, but it is unlikely that positive action will be taken to remedy the situation until construction management fully appreciate that materials waste means lost profits and unnecessary increases in contract prices. Infact, waste is either directly or indirectly a financial loss to client, contractor and operative alike. Moreover, one cannot ignore the fact that it also represents a depreciation of resources for future generations.

Individual contracts have increased substantially in size and value, necessitating more sophisticated management techniques and increased mechanization of the construction process. All this has increased the demand for materials beyond the capacity of the traditional sources of supply (Ezeokonkwo, 2013). New materials are being introduced and traditional materials are being processed and manufactured into new products. This increase in the total quantity of materials used has in turn led to an increase in the amount of waste.

## **MATERIALS MANAGEMENT**

Material management is a function responsible for coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide predetermined services to the customer at a minimum cost (Edugie, Iroegbu & Ihenketu, 2016). It is therefore desirable that every materials manager should try to apply proper materials planning, purchasing, handling and storing so as to achieve the desired objective of minimizing materials procurement and stock holding costs. Recently, the integrated materials management concept has gained greater acceptance. This has necessitated professional development managers so that they can fulfill the requirements of an integrated materials management function which demands an ability to bring together conflicting and yet interrelated functions, viz materials planning, purchasing receiving and inspection, stores, inventory control, scrap and surplus disposal. The economic pressures in the form of inflation and credit squeeze have placed exacting demands on the materials managers. In an integrated set up, the materials manager who is responsible for all such interrelated function, is in a position to exercise control and coordinate with an overview that ensures proper balance of the conflicting objectives of the aforesaid individual functions. The important advantages of integrated material management are better accountability, better performance, better growth and adaptability to electronic data processing (Ezeokonkwo, 2013).

## **Material Cost**

Material cost can be very effective if involves the cooperation of various departments, such as:

- Purchasing department
- Receiving and inspection department
- Stores, production and stocks control department

Material is the most significant element of cost and accounts for anywhere between 40% to 70% of the total cost of production. Cost control activities are therefore, directed mostly towards selection, purchase, storage and consumption of materials. Material cost can be classified into two namely:

- a) Direct material cost
- b) Indirect material cost

## **Direct Material Cost**

These are the cost of those materials which enter into and form part of the product, such as cement, sand, stone, gravel, reinforcement, and includes:

- a) All materials specially purchased for a job or a process
- b) All materials issued from the stores against a particular job order number or process.
- c) All components or assembly parts purchased for use in the jobs and process directly.
- d) All materials or processed materials transferred from one process or operation to the other.
- e) All primary packing materials such as poly bag, cement bag.

## **Indirect Materials Cost**

These are the cost of those materials which cannot be traced as a part of the product, such as:

- Consumable stores used in the operation.
- Lubricating oil, grease, fuel
- Tools, jigs, equipment and fixtures
- Sundry stores of small value like cotton waste, broom stick

Grouping of materials under direct and indirect may often become a matter of convenience, and materials of small value may not be treated as direct cost even if it is possible to identify the same.

## **MATERIAL COST CONTROL**

According to Edugie, Iroegbu & Ihenketu (2016), the silent features of material cost control include:

- a) The quality and specification of materials shall be commensurable with the requirements of product, so that neither too expensive or superior nor cheap or inferior material shall be selected for use in product.
- b) The purchasing shall aim at minimum price to suppliers and timely procurement and shall avoid urgent purchase at higher cost.
- c) Storage of materials shall be such that there will be neither overstocking, and thereby blocking capital, nor running out of stocks and creating interruption in production process.
- d) Wastage and losses shall be avoided at every stage of operation.
- e) Materials should be classified and accounted for both in physical units and value in such a way that information about availability in stock can be obtained promptly so as to assist production, planning as well as timely buying.

Material cost control involves the following activities:

- a) Purchase and procurement
- b) Receipt and inspection
- c) Storage, issue and consumption
- d) Valuation and accounting

### **Purchase and Procurement**

In a big organization, purchasing may be an independent function reporting to the chief of operations. It may be under production department if the size of the organization is very small. Under either circumstance, the purchase department must be equipped with efficient staff fully conversant with the production process and requirements. Purchasing is a very specialized job and requires the skill of an expert buyer. Both cost and quality of the product depend to a large extent on the judgement of the buyer (Management accounting n.d.). Materials purchasing can be centralized and decentralized depending on the nature of site. If the organization has several units scattered over a wide area, it may be beneficial to have centralized purchasing for those items of materials which are used commonly by all units. If the quantum requirement by each unit is small and materials are dissimilar between the units, it will be more economical to have decentralized buying (Edugie, Iroegbu & Ihenketu,

2016). Edugie, Iroegbu and Ihenketu also maintained that, purchase procedure follows the steps, such as:

- 1) Receiving purchase requisition
- 2) Inviting quotation and enquires
- 3) Receiving and finalization of quotation and placing purchase orders
- 4) Follow up of order

### **Receipt and Inspection**

With the receipt of materials from the supplier, the storekeeper shall refer to the challan to find out purchase order concerned, and shall prepare a stores received note (SRN).

### **Storage, Issue and Consumption**

Movement of materials from store takes place on the basis of the following documents:

- a) **Material Requisition Note:** This is an authorization to the storekeeper to issue material (duly signed by the authorized person of the receiving department).
- b) **Material Transfer Note:** This document is used to record transfer of materials from one department or job to another.
- c) **Material Return Note:** This document is an authorization to return excess materials to stores.

### **Material Control**

The construction department needs materials and components, the purchase department procures such materials of right quality and right quantity from various suppliers, the stores department receives and stores them after quality approval by quality control department and finally issues them to construction department (Ihenketu, 2015). Thus, it is evident that a perfect coordination between these departments is absolutely necessary in order to keep the cost under control. Otherwise situations like stock-out, construction distress, purchase at higher price, wastage due to wrong quality will occur (Management accounting n.d.).

In large organization, a material control or production planning and control department is created to coordinate the activities of construction, purchase, stores quality control and accounts departments. It ensures effective control at each stage of operation right from placing requisitions till the disposal of scraps and obsolete materials. The essential requirements of the system encompass the following:

- a) Classification, codification, standardization and rationalization of all stores into raw material – classified into standard and no standard items, packaging materials, components and assemblies, engineering stores and machine parts, loose-tools, laboratory supplies, inspection materials.
- b) Determining standard or norm for consumption of stores as well as stockholding at various levels.
- c) Use of standard forms and documents.
- d) Planning of material requirements by receiving position of finished stock and work in progress, stock-status in stores, and expected arrival as per orders placed.
- e) Continuous updating of stock position with the available from purchase stores, construction and dispatch departments.
- f) Arranging conversion of basic raw materials into components through converters contract labour.
- g) Preparing regular reports to management indicating stock-holding, ordering position, consumption, critical items, excess storage, slow-moving, non-moving, dormant, surplus and obsolete stocks by quantity and value.

### **Material Records**

For stores control, two sets of records are maintained. There are:

1. Bin cards by stores
2. Stores ledger by accounts (cost) department

### **Bin Cards**

It accounts for quantity only. This refers to quantitative details of receipt, issue and balance. Entries are made immediately on receipt or issue of material. This is known as bin card, as the cards are usually kept attached to the bins in which materials are kept (Management Accounting n.d.).

### **Stores Ledger**

It includes value into account. The stores ledger is maintained in the cost accounting department and contains the same information as in bin card with addition of rate and value of materials. Generally, stores ledger is maintained in a loose-leaf form. The number of ledger cards are the same as in case of bin cards, and the two sets are reconciled when physical inventory is taken. The sources of posting in bin cards and store ledger are the same.

### Material Cost Price

Material cost price include all expenses incurred on placing the materials in stores or at any other hired or owned located as required by the purchase order. Such price include cost, insurance, freight, excise duty, and any other special charges such as rent, or deposit for container, interest charges for credit period allowed, and will be reduced by the following credits:

- a) **Trade Discount:** Normally, net of discount is shown as invoiced price. This includes quantum of discount allowed periodically.
- b) **Cash Discount:** This is shown separately in the invoice as an allowance amount since it is optional for the buyer. If cash discount is available, it should not be included in material cost, as it is a purely financial income.

### CONCLUSION

The preparation and use of materials inevitably creates a certain amount of waste, but this can be assessed in advance. Materials are also wasted by design requirements e.g. uneconomic cutting of timber sections to achieve non-standard solutions, and elevations resulting to increase in construction cost. Proper material management cannot be overemphasized since it is responsible for coordination of planning, sourcing, purchasing, moving, storing and controlling materials in an optimum manner so as to provide predetermined services to the client at a minimum cost.

### RECOMMENDATION

1. Storekeeper should be appointed on any site for receipt, receive, storage and issue of materials.
2. The location and layout of stores should be decided very carefully to minimize multiple materials handling.
3. Materials brought to site should be accounted for on a daily basis.

### REFERENCES

- Edugie, J. I., Ireogbu, I. O. & Ihenketu, C. (2016). Site management: Theory and practice. Enugu: John Jacob's Classic Publishers Ltd.
- Ezeokonkwo, J. (2013). Materials quality control. Unpublished manuscript, Nnamdi Azikiwe University Awka.
- Ihenketu, C. (2015). Site management. Unpublished Lecture note, Akanu Ibiam Federal Polytechnic, Unwana.
- Johnson, J. E. (1981). Site controls of materials: Handling, storage and protection. England: Billing & Sons Ltd

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Management Accounting (n.d.). Study materials prepared by institute of cost and works accountants of India for junior accounts officers (civil) examination conducted by controller general of accounts. Unpublished manuscripts.

UK's Building Research Establishment (1976). Review of material waste. Retrieved March 14, 2017, from <http://www.google.com>