

Challenges Regarding Management Practice Of Cement On Construction Sites North-Eastern Nigeria

¹arinze N. A.;² Dammo.M. N.; ²Isa A.;²Deborah, J. M.; ³Aji. A.Band
² G. B. YUSUF

¹*Department of Building Engineering, Ramat Polytechnic Maiduguri, Nigeria*

²*Department of Civil Engineering, Ramat Polytechnic Maiduguri, Nigeria*

³*Department of Civil Engineering, Federal Polytechnic Damaturu, Nigeria*

Abstract: Cement management is particularly problematic by selected contractors in Maiduguri. This paper is written to fill a void created by the absence of proper cement management on construction sites. To managing a productive cost efficient and site efficient cement management is very essential. Research showed that, 89%, of the contractors manage and concentrate on cement operations on the site; 37.1% of the contractors employ qualified stores operation officers; 71% of the contractors calculate the quantity of cement required before purchasing; 27.7% of the contractors have poor mechanisms in place to engage cement suppliers; 78.9% of the contractors experience delay in cement delivery; 90.6% of the contractors inspect cement on arrival to site; 78.9% of the contractors s in terms of protecting cement from damage during storage; 41.2% of the contractors have average mechanisms in place to reduce wastage of cement on site; 86.6% of the contractors have enough mechanisms in place to protect cement from theft on site. From the results, it was concluded generally, management practices of cement is poor. The poor performance were resulted from contractors profits are eroded and they devise sharp practices using poor quality and inadequate quantity of materials to execute jobs. This practices lead to project failures, early maintenance needs and cost overruns from the clients' stance. Therefore the proper management can improve the productivity and cost efficiency of acement management to achieve better project delivery.

Keywords: Management practice, Cement, Construction Site, North-eastern Nigeria.

I. INTRODUCTION

Materials management is the scientific method of procuring, storing, safeguarding, transporting and utilizing materials on site in order to ensure economy and achieve waste minimization (Charlett, 1982). Materials management, from a scientific perspective, had been a 'Cinderella' activity in the construction industry, especially in Nigeria (Adeagbo and Kunya, 2003). Materials are the lifeblood of many industries and it constitutes more than 50% of the total annual expenditure of a typical manufacturing industry (Fajemilua, 1997). In the construction industry, Adeagbo and Kunya (2003) noted that materials constitute a large percentage of the costs that go into the building production, claiming it occupies about 63% in relation to labour contribution of 37% in a typical traditional building construction. The concept of materials management is geared towards providing the right materials in the right quantity and quality at the right place and time as well as minimizing waste levels and ensuring profit maximization. However, a study conducted by Adeagbo and Kunya (2003) revealed that construction professionals pay little attention to the value of materials on site, and they see waste as the inevitable consequences of the construction process.

Where poor materials management are exercised, some negative consequences include over-consumption of construction materials resulting from poor material accountability and record keeping; damage caused by mishandling, undue exposure to weather and vandalism; and excess materials after job is completed (Greenwood, 2004).

Today's construction industry demands prudence in all aspects of materials management, especially on cement. This is because contract acquisition is becoming increasingly competitive; hence the need for contractors to be more prudent in handling and utilization of materials. Several projects experience cost and time overruns in Nigeria due to several factors such as clients' behavior, contractors' faults, material price fluctuations, poor material management practices, etc (Achuenu and Kolawole 1988). Materials constitute more than 60% of the total cost of projects (Adeagbo and Kunya, 2003). Cement is one of the most expensive, easily stolen and unstable construction materials in Maiduguri today, owing to the fact that most of the cement used comes from Ashaka cement factory with its attendant high cost. Also, several buildings are collapsing due to poor quality of work. The project sets out to appraise the general level of compliance of selected contractors in Maiduguri towards cement management practices. This is targeted to assess by how much compliance or

otherwise this affects the general cost of projects. Fajemilua (1997) advocated that materials management should embrace the coordination of purchasing, storing, inventory control, production control, scheduling, traffic, warehousing, distribution and other related functions within a single department which is headed by a materials manager. This offers such advantages as improved coordination and control of material flow; elimination of buck passing and conflicting objectives; greater opportunity for cost reduction in the purchased items and increased prospect for application of modern management tools such as operational research, computer technology to solve material problems; improved services to sites and enhanced inter-site co-operation; and avoidance of wasteful duplication of efforts.

Poutpouri (2000) maintained that project managers must, amongst other functions, perform the task of materials procurement of the right quantity and quality and at right time. Poutpouri (2000) further stated that materials management should consist of preparing material procurement schedule (MPS), developing the required materials deciding appropriate quantity for procurement, budgeting and arranging approvals and purchases, preventing waste during site handling, and supplying on time the appropriate quantity and quality of materials for effective project delivery. According to Fajemilua (1997), materials constitute more than 50% of the total annual expenditure in a typical manufacturing industry. This figure is however lower than that presented by Adeagbo and Kunya (2003). According to Adeagbo and Kunya (2003), materials constitute about 63% of cost in comparison to labour's input of 37% in a typical building construction, with contribution from other resources ignored. Tersine (2002) stressed that materials management is a technique of improving productivity of industrial production, suppliers' facilities and distribution warehouses. Tersine (2002) also noted that the complexity of materials management depends on the type of product, quality and reliability levels demanded, storage capabilities for purchased items and the level of knowledge of users of the material management system.

Bred (1981) relates waste level to materials management practice on site, deriving a somewhat inverse relationship between the two. Although waste occurs at all stages of material-handling operations, proper materials management practices will help to reduce its level. Bred (1981) further noted that direct and indirect wastes can occur due to poor materials management practices on site. Direct wastes include complete loss of materials due to damage on site while indirect wastes occur when materials are either used for purposes other than those specified or in excess of measured quantity in order to meet the dictates of production. Greenwood (2004) identified common causes of waste as over-consumption of material resources, damage of materials due to exposure to inclement weather or inadequate storage, vandalism, poor material recording and poor accounting system. Sepa and Ciria (2008) advised the use of proactive approach towards waste minimization rather than a reactive one. It also adopted the use of 'partnering', which is a concept where designers, contractors, suppliers of materials and tradesmen on site are duly integrated towards overall material waste reduction. Kolawole (2004) identified decrease in productivity as another consequence of poor materials management. Bred (1981) maintained that unaccounted and uncontrolled material wastage, decreased profitability and improper store management are some of the negative consequences of poor materials management practice on construction sites. Orlicky (2005) identified increased profitability, availability of right quantity and quality of materials on site as well as provision of concise and timely report to management through accurate inventory control. Charlett (1982) noted that proper materials management has an indirect effect in deterring site accidents and vandalism through site tidiness. In regard to the above expectations, several materials flow diagrams have been identified. Farrow (1992) advocated for a material flow in the construction site where material acquisition is initiated upon successful acquisition of contract. Here, the supplier (or vendor) delivers the required materials upon receipt of 'an order' by the buying department. On the overall, the materials manager oversees the whole flow of material procurement as depicted in Figure 1.

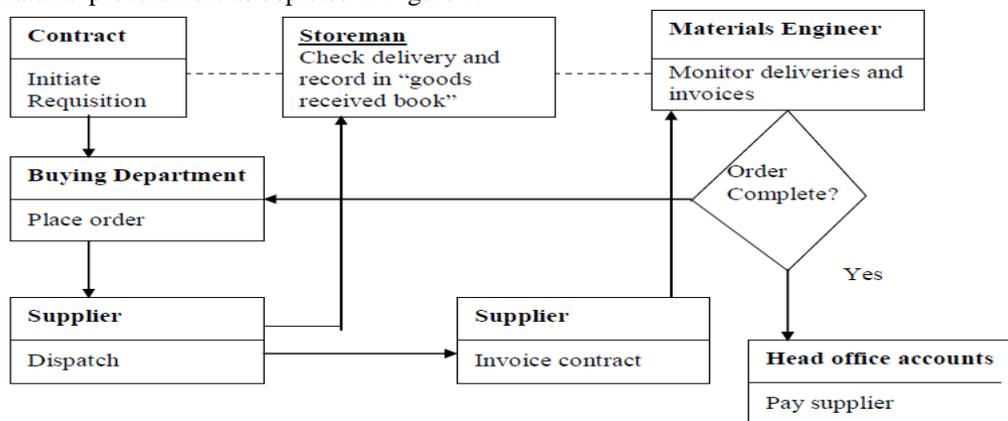


Fig 1. Material supply chain

(Source: Farrow (1992))

Fajemilua (1997), Baily (1982) and Lee (2005) identified some basic components of materials flow process as including initiating material purchases: sourcing of suppliers, enquiry stage; placement of order, delivery, reception and inspection; material storage; disbursement and utilization. The aim of this project is to appraise the level of cement management practices by contractors in Maiduguri, and the objectives are to assess the current cement management practices amongst some selected contractors in Maiduguri, in terms of acquisition of materials on sites, daily stores operation; cement delivery by suppliers, cement inspection onsite, protection of cement from damage during storage and cement wastage during site utilization on site. As well as identify factors militating against the areas enumerated and proffer solution(s) using results generated.

II. METHODOLOGY

Study Area

Maiduguri, the capital of Borno State lies within latitude 10°N and longitude 11°30'E and 14° 45'E. Borno State has an area of 61,43559km and is one of the largest states in the Federation in terms of land mass. It is located in the North Eastern corner of Nigeria and occupies the greatest part of the Chad basin, sharing borders with the Republic of Niger to the North, Chad to the North- East and Cameroun to the East (NPN 2006). Provisional census figures put Borno state to have a population of 4,151,193 and population density of approximately 60 inhabitants per square kilometer. Maiduguri is populated by civil servants, business men and women, though there are farmers, herdsman and fishermen living near and far.

Types of Data Collected

Data relating cement management practices were collected using questionnaires. 100 questionnaires were distributed randomly to selected contractors, out of which 85% were recovered, and 15% were lost. The data collected were analyzed, using simple statistical technique.

Table 1 Response to questionnaires

Data	Category	Response (%)
Qualification	SSCE/NECO	-
	ND	5.9
	HND/BSC	80
	MSc	14.1
Experience in construction work	Months	18.8
	Years	81.2
Record mechanism in cement	Yes	2.4
	No	97.6
Delay in cement supply	Yes	78.8
	No	21.2
Contractors' response to delay Of cement supply	Suspend selling	66.3
	Place emergency order	33.7
Physical inspection of cement On delivery	Yes	90.6
	No	9.4
Storage method of cement	Timber platform covered With water proof material	95.3
	On the ground covered with Water proof material	4.7
Wastage of cement at the job site	Yes	95
	No	5

III. DISCUSSION OF RESULTS

Results in table 1 showed, majority (81.2%) of the contractors engage in construction work, for many years. The absence of lack of experience observed were due to lack of interest and commitment. This trend, over time, had forced contractors to either close or expand their businesses to accommodate construction work, since buildings are usually on high demand by the government, corporate bodies and private individuals alike. Statistically average experience of the respondents in construction works is 4.72 years with a standard deviation of 2.63 years. The experience is very impressive as to construction management practice. 78.8% experience delay in supply, these inadequacies are not in conformity with accepted practice of cement management and could create financial losses to the contractors and 78.8% of the contractors experienced delay in cement delivery and therefore suffer losses which include cost of keeping from damage. 90.6% of contractors perform satisfactorily in terms of inspecting cement on arrival to site before they are accepted. This practice conforms to accepted practice on cement management practice and saves cost of inadequate quantity and poor quality of cement. 95.3% of the contractors have mechanisms in place which minimize cement damage. Because direct contact of cement with moist environment could cause setting of cement which deteriorate quality of cement, thus leading to financial losses to the contractors. 95% of the contractors lack the mechanisms to minimize cement wastage on site during utilization, these result from lack of incentives and poor supervision.

IV. CONCLUSIONS

- The study showed most contractors are ignorant of the importance of efficient and effective cement management practices on site. The contractors are just interested in their profit margin and not the quality of work.
- The study also reveals that the contractors lack competent personnel to oversee cement utilization activities on site.
- The relevance safe-guarding cement on site is clearly supported by the current findings to correctly locate stores on site, to determine the conditions of storage and the types of systems used in controlling stores materials.

Recommendations

- Head offices should monitor site cement management practices effectively in order to discourage any sharp practice from the site operatives. This will ensure that the contractors finish jobs with expected profits not unduly affected.
- Efforts must be made in order to train store officers in modern store-keeping best practices. This will ensure cement is not lost due to inefficiency. It will also ensure that adequate inventory management of cement on site. These practices will prevent undue claims from the contractors who exploit technically ignorant clients.
- Adequate supervision and incentives given to site operative should be aimed at discouraging wastage of cement during concreting and other activities on site. This will reduce the level of contractors' losses, thereby protecting the clients to some extent.

REFERENCES

- [1] Achuen, E. and Kolawole, J.O. (1988). Assessment of Cost Overruns in Public Projects in Nigeria", Nigerian Journal of Construction Technology and Management (1), p 8.
- [2] Adeagbo, D. O. and Kunya, S. U. (2003). Review of Waste Reduction Strategies on Nigerian Construction Sites, ATBU Journal of Environmental Technology, Vol. 2, pp 49- 50.
- [3] Baily, P. J. H. (1987). Purchasing and Supply Management, 4th Ed., London: Chapman and Hall, pp 251-413.
- [4] Bred. (1981). Waste of Building Materials, T 6, No. 247, Building Research Station, pp 2-8.
- [5] Charlett, A. J. (1982). Deterring Vandalism on Building Sites, The Chattered Institute of Building Technical Information Service, No. 1, pp 1-8.
- [6] Fajemilua, B. (1997). Introduction to Purchasing and Supply Management, Ile Ife, Obafemi Awolowo University Press Ltd, pp 18-218.
- [7] Farrow, T. (1992). Modern Construction Management, London, Prentice Hall, pp 76-85.
- [8] Greenwood, R. (2004): "Construction Waste Minimization – Good Practice Guide", www.cf.ac.uk/arcj, pp 8-10.
- [9] Lee, L. (2005): Purchasing and Materials Management---Text and Cases, New Delhi, McGraw-Hill Co. Inc., pp 16-420.
- [10] Orlicky, J. A. (2005): Material Requirement Planning, New York, McGraw-Hill, pp 102, 146.
- [11] Tersine, R. J. (2002): Principles of Inventory and Materials Management, 2nd Ed., Amsterdam, Elsevier, p 20.