

Stores and Inventory Management

Introduction:

Stores management is part of the overall function of materials management. In order, therefore, to understand the function of the former it is desirable to have a clear understanding of what materials management stands for. Beginning with the term management is important to examine its definition and objectives.

Management is the specific purpose of planning, controlling and implementing.³Materials management' is one of the recent additions to the growing glossary on management.

Materials management is the process of planning, implementing and controlling the flow or storage of input, facilities, service and information efficiently and effectively from the point of supply to the point of consumption in the conformity of the companies' objective.

Stores organization may be defined as a systematic coordination and combination of efforts in manner, which would result in optimum efficiency with a minimum of expenditure.

The term Store, Storehouse, or Warehouse refer to a building or room or place where materials are kept.

Objectives and Responsibilities of The Store function

Store is an organization is primarily intended to assist in the production of goods or services and no industrial unit of public undertaking of any significant size can be efficiently managed without it.

The basic objective is to provide a service to the operating functions and this aspect must be fully appreciated. All the other activities, although they have their own importance, are subordinate to the main responsibility.

The service rendered by Stores can be categorized into 4 broad divisions:

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- ψ To make available a balance flow of raw materials, components, tools, equipments and any other materials necessary to meet operational requirements.
- ψ To provide maintenance materials, spare parts and general stores as required.
- ψ To receive and issue finished products.
- ψ To accept and store scrap and other discarded material as they arise.

The major responsibilities of Stores are:

- ψ Identification of all material stored.
- ψ Receipt of incoming goods.
- ψ Inspection of all receipts.
- ψ Storage and preservation.
- ψ Materials handling.
- ψ Packing.
- ψ Issue and dispatch.
- ψ Maintenance of stock records.
- ψ Stores accounting.
- ψ Inventory control.
- ψ Stock-taking.

Organizing stores

Traditionally, this department has been attached to the production department, even considered part of it. The finished Goods Stores was attached to the Sales Department. Today, it has been recognized that both Production and Sales has vested interest, which conflict with the basic objectives of inventory control. As such, the modern concept is to delink Stores from Production or Sales. The best practice is to place stores under the materials manager and make it part of the materials department.

The materials manager will have the status of other senior departmental heads of production, sales or finance, who report to the chief executive.

The stores department can be divided into the following divisions/sections:

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A central stores, with sub-stores 1, 2, 3,« (The central stores according to products, and sub-stores according to shop requirements)

- ψ Receipt stores
- ψ Inspection wings
- ψ Finished goods stored
- ψ Packing section
- ψ Despatch section
- ψ Transport section
- ψ Clearing unit ± sea, air, rail
- ψ Stores hose keeping ψ
- Stock-taking/Audit
- ψ Record keeping
- ψ Stores accounting

DUTIES AND RESPONSIBILTY OF STORES PERSSONEL

A storekeeper would have several duties and responsibilities, which he may carry out himself or through his subordinates. These are:

- ψ To receive incoming materials, including all work connected therewith, like opening of packages, counting and checking.
- ψ To stare materials in the right place and in the best suited prescribed manner.
- ψ To ensure that materials are properly preserved, periodical inspection and correct methods.
- ψ To carry out all movements of materials including movement to Storage from receipt and Storage to Despatch, Packing and Forwarding.
- ψ To maintain complete, up-to-date and correct records both for physical storage financial accounts.
- ψ To attend all correspondence, etc.

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The storekeeper's function may be compared to that of a cashier, because in the final analysis, material is money. Thus, as much as attention should be paid to materials by a Storekeeper as to money by a cashier.

CENTRALISED AND DECENTRALISED STORES

The structure of store is a major factor in its organization. A very big factory having a large number of product lines may have a main stores which can serve as base, with decentralized stores for each unit of production, preferably located as near the unit as possible. Another possibility is that the main store can be completely eliminated and supplies effected directly to the suit stores. In a small company, one store would be adequate to serve all units.

A large company marketing a variety of goods may have a central warehouse of finished goods at its factory location, besides large number of stockpoints in the various cities. A small company on the other hand can have just one simple warehouse from which the entire distribution can take place.

Centralization or Decentralization then is a matter of convenience. However, one basic organizational feature must be observed. The entire Stores setup should be under the unified control of one department with Senior Controller of Stores incharge, in order to efficiently achieve the objectives of the function, of stores.

Types of Stores:

Stores fall into broadly two categories contingent on the following considerations:

- ψ Functional: depending on the use to which the material is put ± chemical, tools, raw materials stores, etc.
- ψ Physical: depending on its size and location ± central stores, sub-stores, sites stores, etc.

LOCATION OF STORES:

The first question that arises is with regard to the location of the stores. Will there be one store or many? Should it be very close to actual

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construction site or away from it ?What transport facilities should be made available?

These questions stem from one primary concern ± who is being served and what are the services provided. It must be remembered that economy and efficiency are the vital factors.

Some of the principles to be observed in this regard are as follows:

- ψ In choosing the location, observe the principle of minimum movement.
- ψ Plan for future. A storehouse should not merely take care of present needs but also those of the future.
- ψ All storehouses should be sited with expansion in mind.
- ψ There should be a considerable degree of flexibility.
- ψ Accessibility for road, rail or river transport should be an important consideration. Planning should concern itself with loading and unloading facilities.
- ψ Sufficient precautions should be taken to maintain security from fire, theft, explosion, toxic substances, etc.
- ψ A variety of services must be provided for water, light, drainage and telephone, etc.

STORES BUILDING & STORES LAYOUT

- ψ The primary importance is given to the inward & outward flows of raw materials & vehicles in an orderly fashion.
- ψ Working areas, including raw materials inward & outward , maintenance areas & packing areas should be grouped as closely together ,that would reduce the costs.
- ψ The height of the building from floor to ceiling must be enough to permit maximum loading & tacking level of materials
- ψ Main gangways should run the length of buildings & ac ross in short ones
- ψ Gangways must be wide enough for two large vehicles or mechanical equipments likely to pass each other without collision

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- ψ Subsidiary gangways should run of the main gangways but not necessarily at right angles
- ψ Proper lightning must be provided.
- ψ Door should be wide & high enough.
- ψ Floor thick ness & strength must be specified & checked.
- ψ Fire precautions need to be carefully considered & provide fire exits.

STORES LAYOUT

Two factors in determining layout are economy & efficiency. A store house which is not fully utilized is a waste of capital. The one who holds too much is waste full

There are four main work criteria:

- ψ Receipt & inspection of material from suppliers & their storage.
- ψ Picking of materials, their issue & dispatch.
- ψ Stock-taking.
- ψ Stock maintenance, stock turn over, periodic inspection, maintenance & rebinning.

STORAGE FACILITIES

The primary factors in storage are:

- ψ An item must be found when required.
- ψ It must be possible to issue the oldest stock (FIFO) without undue effort.
- ψ The item should be in good condition when it is selected for issue.
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- ψ Storage equipment should be easy & quick to use without risk to man or material.

The other categories are:

- ψ Bins.
- ψ Racks & shelves.
- ψ Flat pallets & Stillages.

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- ψ Post & Box pallets.
- ψ Block racks.
- ψ Heavy lifts & awkward item storage.

Bins: Bins are expensive & as many items as possible should be put into them, refilling being done on a regular basis. Racks: Racks can be used either as the picking face for items which are too big or heavy for bin accommodation, or else for keeping reserve stocks for replenishing bins.

Static racking, live racking, Drive through racking, Honey comb racking, self-erected racking.

Pallets: pallets are specially designed platforms for the stacking of goods, with view to the whole load being moved, wherever it is required, by a fork-lift.

Block stacking: here boxes or pallets are stacked directly one upon the other. In all block stacking the primary consideration is the safety and stability of the stack, ease of access.

Heavy & Cumbersome items: the movement of such material is likely to block the flow in their immediate area for a little while. It may often be necessary to use a crane, lift, bringing it directly over the item concerned.

CLASSIFICATION OF MATERIALS

Classification is the grouping together of materials of technical affinity

These are divided into smaller categories for convenience.

- ψ Purchase department: separate enquiries can be issued for specific groups or materials since separate purchase requisitions can be made of each group.
- ψ Materials can be routed to appropriate stores for stocking materials group wise.
- ψ Inventory control: stock control cards can be grouped together for materials of the same nature.
- ψ Stores: receipts & issues can be posted correctly by coding or goods receipt notes.
- ψ Accounts: the GRNs can be entered on the correct cards.

CODIFICATION

Every item group under classification should have a material code no or reference no, it specifies what the material is. It helps by:

- ψ Accurate identification of items.
- ψ Long descriptions with detailed specifications.
- ψ Accurate posting of receipt & issue documents in the appropriate records.

RECEIVING AND INSPECTION

The function of receiving and physically handling delivered materials, together with verifying that the deliveries correspond exactly to those specified in the Purchase Order, is usually performed not by the purchasing department but by a specialized group in the Receipt section, which is usually independent of Purchasing and works in conjunction with stores. A small store carries out the work of receiving by the store itself.

The function of inspection because of its wide and varying scope may be performed by the receiving personnel or by inspectors attached to Quality Control. It is the purchasing department's responsibility to see that inspection is not overlooked or neglected during the process of purchasing. Receipt, inspection and storage of materials constitute the last phase of purchasing activity. Inefficiency at this last phase can spell untold difficulties to the materials function and this is true in quite a large number of organizations.

There are two aspects involved in receiving material:

- 1) All incoming items are to be physically counted or measured for accuracy and they have to be inspected for quality.
- 2) This work has to be done quickly and efficiently and the goods taken into the stores without delay.

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The main bottleneck usually noticed is the lack of co-ordination between the inspection staff and the receipt clerks. It is therefore necessary that the receipt is manned by efficient clerks who have not only been thoroughly trained in their work, but who have been given a clear understanding of the importance of their work in relation to the efficient functioning of the company.

The receipt section sometimes also called the Receipt Store or the Inward goods Department is responsible for the receipts of all materials coming into the company.

Location Of Receipt:

In any storehouse, security is of the highest importance and as such, there should be a total prohibition of outsiders coming there. In view of this need for security the receipt stores should literally be cordoned off from the main stores, though for all practical purposes it may be located in the same building. The receipt store should also be away from the dispatch section. This is to avoid any mix up of incoming and outgoing consignments.

The principal advantages of having separate receiving stores as opposed to merging it with the main stores are:

- ψ Outsiders are denied access to the various stores or production shops.
- ψ Possibility of uninspected materials or goods not covered by the G.R.N. (Goods Receipt Note) being taken into stock is reduced.
- ψ There is a double check of all incoming materials.

The location of receipt store should be such that there is no congestion or problem of parking or turning of the vehicles. There must also be adequate space to receive the materials, open the packages, and store the materials before taking the goods in stock. Double handling should be avoided.

ORGANISATION ±

The receipt stores usually part of the Stores set-up and is under the Stores-in-Charge of stores. Depending on its size and complexity, it will have a few clerks and a supervisor can be at a fairly junior level in most cases, but for a very large Receipt Store, there can be senior officer also.

The receipt store can be of three types:

- ψ Centralized: Where all the goods are received at one place.
- ψ Semi-centralized: Here the paperwork can be done at one place and the actual deliveries at the shop floor or yards, etc.
- ψ Decentralized: In this case there is a separate receipt section attached to each store or group of stores. This might be because of the specialized nature of the articles or because of the distances between production shops.

Good storage procedures have several benefits:

- ψ They enable smooth running of storage and aid in the reduction of delays and bottlenecks in office work.
- ψ They assist in speedy execution of work because what is to be done is clearly laid down. No one is in doubt and trained clerks need merely follow instructions.
- ψ They assist a better control on what is done and act as a check on how it is done.
- ψ A good procedure will have sufficient internal in-built checks at work this can aid in prevention of fraud and establish a better control over the work done.
- ψ They can lead to economies in expenditure because of savings in terms of indirect labour & overheads.
- ψ There will be a greater coordination between stores and purchase, Inventory Control, Receipts etc. and also between stores and production. Accounts, and other departments.
- ψ Procedures well laid down, facilitate training of staff because it is easy to make people understand and practice set procedures and methods for carrying out work.

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- ψ They reduce chances of error and thereby add to overall efficiency.
- ψ Proper accounting and better stock control will result.
- ψ Proper storage and improved preservation of materials are the outcome of the practice of goods storage procedure.
- ψ Speedy issue will take place.
- ψ Quick identification of material is enabled.
- ψ They result in less damage to material during handling.
- ψ Reduce inventory will result.

Storage and preservation

The term 'storage' is a comprehensive one referring to the keeping of goods safely and in good condition. Some people however would like to draw a distinction between storage and 'preservation'.

Storage refers to the physical act of storing or housing particular materials. This might be screws, large machinery, equipment or parts, liquids like petroleum, dangerous substances like sulphuric acid, or a gas like oxygen. Each material has its own storage requirements and knowledge is necessary as to how and where they are to be stored, their handling and issue and so on.

Some general aspects of storage are as follows:

- ψ Stores should be prevented from falling off shelves or out of bins.
- ψ The sides of bins should be such that they prevent materials from getting lost or mixed up. Segregation of materials is of the utmost importance.
- ψ The bins must be of the right size. If it is small, the item will stick out and cannot be placed correctly. Untidy stacking will result. If, however, the bin is too large, waste of space occurs.
- ψ Storage should facilitate handling.
- ψ Storage must also allow adequate ease in counting, checking and issue.
- ψ Adequate security and safety should be exercised and this involves safety of materials, equipment and men.

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- ψ There should be maximum economy exercised in relation to the volume of space occupied. Storage volume available quantities held in that it often happens that the company increases production but the space for storage is kept the same. This can create a problem of space and result in congestion.
- ψ Every material requires a specific method of storing to obtain the maximum efficiency with respect to easy handling, self -life, and prevention of deterioration.
- ψ Unsuitable storage equipment, especially containers for holding powders or liquids can result in losses due to wastage during handling. Good equipment will ensure correct measurement during issue.
- ψ Apart from wastage, spoilage of materials may also occur due to improper storage. Dampness is one major problem in all the stores because it leads to corrosion of metals, solidifies powders, discolors paper etc. Prevention measures would include heating arrangements and also air conditioning with temperature and humidity control.
- ψ Another aspect of storage is prevention of losses due to evaporation, pilferage etc. Theft is common where there is no control on the

Deterioration of Material

Materials often deteriorate in storage making them unusable for the intended purpose .As such they require adequate treatment. Preservation involves the keeping of material in a fresh and serviceable condition.

Some of the main reasons for deterioration are:

Sometime the inherent nature of the material is such that it deteriorates in the course of time.

Another cause is inadequate storage condition. For e.g. cements gets damps and solidifies. Steel in the open can corrode; stationery can get dirty or dusty and consequently become unstable.

A third cause of deterioration is damage arising form accident or bad handling e.g. glassware maybe dropped and broken.

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Preservation Measures

- ψ If any material is found to be infested, the item should be kept apart and duly treated.
- ψ Storage for materials, which have a tendency to deteriorate, should preferably in a proper building. Roofs should be waterproof. The flooring should be strong enough to take the load.
- ψ Infested material that cannot be cured should normally be destroyed.
- ψ Pests and bacteria thrive in dirty environment, so storage space should be regularly swept.
- ψ Proper ventilation should be provided in the storehouse.
- ψ Periodic examination of materials should be carried out to guard against infestation and damages.

INVENTORY MANAGEMENT AND CONTROL

Need for inventory control:

Inventory is maintained basically to ensure operational smoothness. It is the materials department's responsibility to ensure that this operational smoothness is carried out at the minimum cost commensurate with efficiency. This is done through inventory control. Inventory control may be defined as a set of policies and procedures by which an organization determines what materials it should hold in stock and the quantities of each that it should carry.

Inventory consist of:

- ψ Stores inventory: raw materials, spares, components, etc.
- ψ Work-in-process: semi-finished goods on the factory floor.
- ψ Finished goods lying in the warehouse prior to dispatch for sale.

Large inventories tie up large amounts of money. On the other, too little inventory might end up in work stoppages, extra machine set ups, lost sales and loss of customer goodwill because of inability to deliver the

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product. It is of prime importance that a business organization determines and maintains an adequate inventory for a given of business.

Inventory is created for two general purposes- protection and economy. Protection refers to the provision of the necessary raw material with minimum delay. Whereas economy refers to effect lower product cost by realizing the economies resulting from longer quantities per order. There are two fundamental questions which normally arise in inventory control:

ψ How much to buy at one time?

ψ When to buy this quantity?

Four fundamental factors that govern this are:

ψ Requirements: This is based on the information

ψ Quantity in stock or on order

ψ Procurement time or lead time

ψ Obsolescence.

ECONOMIC ORDER QUANTITY

One of the most effective techniques for determination of quantity is called Economic Order Quantity. There are two major cost involved in it: - 1) purchasing cost and 2) inventory cost

The EOQ is that quantity at which the cost of procuring the annual requirement of an item and the inventory carrying cost are equal, that is where the total of the two costs are low.

Selective inventory control: There are variations in the inventory control from item to item and this should be done on selective basis.

Following are the classifications:

1) ABC classification

2) VED classification

3) HML classification

4) XYZ classification

STORES ACCOUNTING AND RECORDS

Stores records:

Various records are used in the stores.

- ψ Bin cards: These cards are very simple, giving the description of the item including the code no., the unit of issues, the quantity of the item, etc.
- ψ Stock cards: These are kept in the stores office. There are various kinds of stock cards- Showing the quantity only, Showing the quantities and unit price, Showing the quantities, unit price, value of stock, value of the balance in stock.
- ψ Stores Transfer Note
- ψ Material return note
- ψ Goods inward note / goods receipt no. ψ
Materials reject no.
- ψ Scrap note
- ψ Gate pass
- ψ Inventory form
- ψ Temporary loan form

Techniques of stocktaking:

- ψ Annual stocktaking
- ψ Perpetual inventory method
- ψ Daily stocktaking
- ψ Checking by stores- in-charge
- ψ Periodic checking

Stock valuation : there are various methods of valuing material issues.

- ψ FIFO: First in first out ψ
LIFO: last in first out
- ψ HIFO: Highest in first out
- ψ NIFO: Next in first out

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- ψ Base stock
- ψ Simple average
- ψ Weighted average
- ψ Standard average
- ψ Replacement price

CONCLUSION

From all the above mentioned concepts and advantages, it is clear that stores and inventory management plays a major role in successful completion of any infrastructure project and also accounts a major chunk of profitability of the contractor.