Nilachal Polytechnic

Bhubaneswar

Sem. : 6th Subject : Const[redacted]

Branch: Civil Engineering

Name of the Faculty : Madhusmita Biswal

Text Book to be followed by Student / Faculty

Book- : P.S.Gahlot & B.M.Dhir (All Chapters)

Chapter-3: Materials and stores management

1.Learning Objectives

Student will learn-

i) the classification of stores

ii) the storage of stocks

iii) issue of materials

2. Essential Questions

i) What is a Bin Card?

ii) What do you mean by inventory control?

iii) Name the two methods of stock control.

iv) Define project store

3. Hours Required

Theory	1hrs
Problems	Not required
Question & Answer Theory	1 hr
Total	**2 hrs**

4. Question for Teaching / Assignment / Self Practice

	02 Marks	05 Marks	10Marks
Teaching	2 nos	3 nos	3 nos
Assignment	2 nos	2 nos	2 nos
Self Practice	1 nos	2 nos	1 nos
Total	**5 nos**	**7 nos**	**6 nos**

Lesson Description

- Store is an important component of material management since it is a place that keeps the materials in a way by which the materials are well accounted for, are maintained safe, and are available at the time of requirement

- Storage is an essential and most vital part of the economic cycle and store management is a specialized function, which can contribute significantly to the overall efficiency and effectiveness of the materials function. Literally store refers to the place where materials are kept under custody.

- Typically a store has a few processes and a space for storage. The main processes of store are (i) to receive the incoming materials (receiving), (ii) to keep the materials as long as they are required for use (keeping in custody), and (iii) to move them out of store for use (issuing).

- Effective management of materials requires proper purchasing policies and procedures to make it available at the right quality, right quantity, right time, right price and right source. Also, suitable materials handling and warehousing are essential elements of materials management.

- The basic responsibilities of store are to act as custodian and controlling agent for the materials to be stored, and to provide service to users of these materials.

- Store needs a secured space for storage. It needs a proper layout along with handling and material movement facilities such as cranes, forklifts etc, for safe and systematic handling as well as stocking of the materials in the store with an easy traceability and access.

Enclosed :

1. Course Material.
2. Question Set.

Faculty **HOD** **Principal**

Course Material

Chapter-3

MATERIALS AND STORES MANAGEMENT

Construction materials

Construction materials are the materials that are utilised for construction purposes.

Construction materials consist of Cement, sand, aggregates, brick, timber, steel, scaffoldings, glass panels, PVC Pipes, wires, plumbing accessories, colour paints, etc.

Storage of construction materials

Schemes of storage of materials depend on the following factors:

a. Type of material:

The storage of materials depends on the type of material to be stored. Materials like sand,aggregates can be stored outside but cement has to be stored in a damp-proof store.

b. Access of materials:

The storage of materials depends on the material accessibility. If the materials like scaffoldings are stored then it should be placed such that it can be placed and removed easily (i.e. accessibility)

c. Location of materials:

The materials should be stored at such places that it is not damaged due to climatic conditions and avoid catching of fire due to increased temperature. (Inflammable materials are stored securely)

d. Amount of materials:

The Store room size should be sufficient to accommodate materials securely within it. It depends on the amount of materials to be utilised during construction activity.

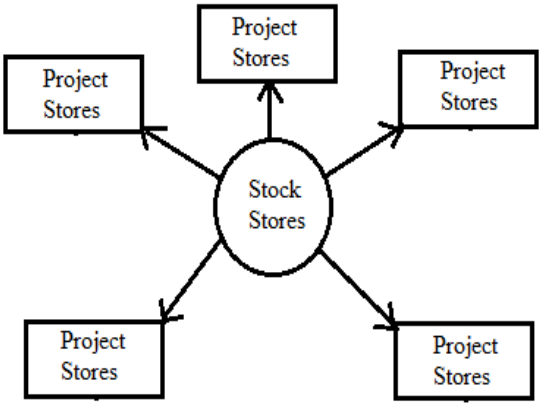
Important Guidelines for storage of different construction materials

1. Cement- It should be placed in dry storage area. Cement should not be stored for long duration.
2. Form-works- Formworks should be placed at stores free from white ants and placed such that counting of formwork is possible and can be accessed easily.
3. Equipment and Machineries- Equipment must be stored at places of minimum corrosion or dust.
4. Steel Bars- Steel bars should be stored in lots and painted to avoid corrosion.
5. Ready Fittings- Plumbing and timber footings must be stored securely in stores in dry condition.

Stores

- A store is a place where materials of construction are properly placed in arranged manner and stored for various construction activities.
- There are two types of stores:

  a) Project Stores b) Stock Stores



a) Project stores- These stores are arranged at construction sites. Once the project at site is complete the on- site stores are dismantled or utilised for other purposes.

b) Stock Stores- Stock Stores are storage places for common building materials. Big construction companies have a separate stock stores from where materials are issued for construction works at various number of construction sites.

Various Principle of Material Management

a. Planning of storage space and minimisation of movement of men and materials.
b. Handling of materials like receiving, storage, in-process handling, inspection, packaging, shipping and transportation should be coordinated
c. Material flow pattern must be based on operation sequence and equipment management.
d. Optimum utilisation of space for material handling.
e. Safe handling conditions to avoid breakage of materials.
f. Reduction of unproductive time.

The objectives of material management are:

1. Efficient material planning
2. Procurement of materials
3. Buying /Purchasing of materials
4. Storing and Inventory Control
5. Supply and distribution of materials to construction site
6. Safeguard the quality of materials

Terminology:

1. Stock:

Stock of materials means various construction materials that are grouped into separate sub-heads and stored in stores.

2. Inventory:

The amount of materials stored in stock is called inventory. The inventory in stock is always monitored so as to avoid shortage of construction material during the progress of construction project.

3. Issue of materials:

When materials are need in construction they are issued from the stores so as to keep record of materials, its amount consumed and remaining, time of issue, etc. to keep track of materials utilised in the construction process.

4. Indent:

Indent is a document generated by the user for the procurement of materials. It consists of a UIN (Unique Identification Number) and details of the material.

5. Invoice:

Invoice is a document that lists the type of material purchased, its amount or number, rate of each item purchased, bill of quantities and the total cost incurred during the purchase.

6. Bin Card:

Bin Card is a document used to record the status of a material in stock. It consists the details of the amount of material in stock, amount of material received and the problem attached to the goods (material).

7. Stock Taking:

Stock taking is the checking of the quantity and condition of inventory stored. It is the investigation team that takes the responsibility for stock taking. This is useful for writing-off losses after the end of a particular task.

8. Stock Control:

Inventory or Stock control are the two processes in material management that utilize the scientific procedures to divide stocks into various categories and handle important materials. There are two types of inventory control: a) ABC Analysis b) VED Analysis

9. Reserve Stock limit:

It is the maximum amount of materials that can be stocked in stores.

10. Minimum holding limit:

Minimum holding limit of stock is that amount of materials at which it must be ensured that the procurement for purchase of that material is initiated.

Difference between various terms:

1. Bin Card and Stores Ledger:

Bin Card	Stores Ledger
a) Bin Card consists of quantity of material received, issued and remaining in stock. b) Bin Card Contains quantity details only. c) Bin card is stored in store rooms only. d) Bin cards are first recorded and then materials are issued.	a) Store's Ledger keeps record of each and every transaction of material from the stores. b) Stores Ledger contains both quantities of material and monetary details. c) Stores Ledger is kept in accounting departments. d) Entering in stores ledger occurs after transaction.

2. **Ordering and Issuing**

Ordering	Issuing
a) Requirements of various departments are noted and forwarded to purchasing departments. b) Materials are not available at stores during ordering	a) Various materials are issued to respective departments when materials are demanded. b) Materials are available at the stores during issuing.

3. **Stock Control and Inventory Control**

Stock Control	Inventory Control
a) Stock control is the method to manage materials directly at the stores. b) ABC and VED analysis are utilised in managing materials at stores properly. c) Stock control is done at stores directly by handling materials. d) Stock Control cannot directly evaluate when to procure materials. e) Categorisation/Division of materials into different categories is done to store materials properly and securely.	a) Inventory control uses procedures to manage materials indirectly. b) Inventory Control uses the tools like reserve stock, minimum and maximum stock limit, stock remaining, etc. c) Inventory control is done at accounting departments. d) Inventory Control can sense the need of procurement at proper time. e) Inventory control avoids the excess blockage of funds in stores and further avoids funds shortage while the project is progressing.

4. **Accounting of Stocks and Accounting of Tools & Plants:**

Accounting of Stocks	Accounting of Tools and Plants
a) Quality and quantity of stocks are recorded. b) When stocks are in shortage, the values are deducted in accounts. c) This account register is closed half-yearly.	a) Only quantity details are recorded. b) Tools and Plant items are recorded here even if they are in shortage and written later. c) This account register is closed yearly.

Material management procedures

Stages of Material Management:

1. Register of Suppliers:

A register of suppliers is maintained containing cost of materials supplied by them. It is updated at regular intervals.

2. Calculate the quantities of materials:

Quantities of materials are calculated/estimated from drawings and specifications.

3. Supply Schedule:

According to plan of work, supply of materials, must be fit into a time frame (time duration). A supply schedule is prepared so that material reaches site of work before the start of planned work.

4. Purchasing:

Depending on supply schedule materials are purchased before time to keep materials ready before construction of particular work.

5. Ordering of materials:

Ordering of material is done basing on the quantities required at a time or in phases.

6. Inspection:

Before the material is brought on to site, inspection should be done. If any rejection is needed, can be done before sending it to site. This will avoid further dispute at later stage.

7. Acceptance and issue of materials:

The materials after being brought to the site are properly stored. Bin cards are generated and other accounting registers are prepared to keep details of the materials purchased and stores in stores and the materials used in construction site (transaction of materials).

8. Use of Network Analysis:

Network technique like CPM can also be used to manage the schedule of materials and the critical events like purchase and order of vital items can be taken care of.

9. Tool & Plants (T&P):

Tools and Plants are procured in a project work for a specified purpose. Tools and plants include construction machinery (Compactors, vibrators, Rollers), vehicles(Trucks, jeeps, dumpers), tools(Hammers, rammers, shovels), surveying

instruments(compass, theodolites, dumpy levels, staff), engineering instruments(Compression testing machine, CBR apparatus, pycnometer),etc.

- The account register is specially maintained to enter the receipt and issue details of tools and plants. That register is called as T&P account register.

Method of stock and inventory control

a) Stock Control:

The materials stored at stores are controlled by stock controlling procedures. There are two stock controlling procedures: a) ABC analysis b) VED Analysis

a) ABC Analysis

In ABC analysis the whole stock is separated into three categories:

1) Category A 2) Category B 3) Category C

Category A Materials are stored in stores and managed in senior management level. Without the consent of the senior management the Category A materials cannot be utilised in the project.

Category B Materials are those materials which are controlled at medium management level.

Category C Materials are those materials which are under control of the junior management level.

b) VED Analysis

In VED analysis the stock is divided into three categories:

a) Vital b) Essential c) Desirable

Vital- These materials are of vital importance. Without these materials any construction task cannot proceed at all. This material is managed at senior management level. Even if vital materials are less in quantity then also it is controlled at senior management.

Essential- These materials are important for construction (essential but not vital)

Desirable- Materials which are desirable for any construction work but are not essential. These materials are managed at junior management level.

b) Inventory Control:

Inventory Control is the procedures used for the controlled management of materials at accounting departments. Inventory control also uses the ABC analysis for material management. The main objectives of inventory control are:

1. To avoid the excess blockage of funds of the organisation:
   Funds are important for construction project to proceed. But if unnecessary utilisation of funds is done for the purchase of materials, the funds may get blocked and may not be available at other stages of construction project.
2. To see that the project is not starved of materials when needed:
   The inventory control utilises the concept of maximum/minimum stock limit, reserve stock(inventory), etc. This allows the organisation to take timely action for procurement of Vital or Category A materials, shortage of which the project would starve and delay progress.

Accounting Procedures of Stores: (Short Note)

The accounts of stores are based on the fundamental principle that cost of every article is ultimately debited to the final head of the account created for each particular work (as simplified in the WBS structure).In case of materials, tools & plants, road metal when required for a specific work can be immediately booked under final head. But in certain cases like purchase of cement & steel immediately purchased due to requirement at site, cannot be booked in the final head of the work directly. It is because the quantity of material to be used at site is uncertain. So these materials are booked under a separate head temporarily called as suspense head. After the completion of the particular work, the suspense heads are put up to the final head and the suspense head of that particular work is cleared.

QUESTION SET

1. Classroom Teaching

Group - A

1. What is a Bin Card? [2016(S), 2012(W)]
2. Define Index & invoice. [2013(w), 2012(W)]

Group - B

1. Differentiate between Bin card and stores ledger. [2011(W), 2012(W), 2014(W)]
2. Explain the principles of storing materials. [2013(S)]

Group - C

1. How is the scheme of storage framed? [2013(S)]

2. Assignment Questions

Group - A

1. What is T&P account register? [2016(S),]
2. What is stock taking?
3. Define project store [2013(S)]

Group - B

1. Explain the procedure of writing off losses. [2011(W), 2012(W),]
2. Explain briefly Store Accounting procedures.

Group - C

1. Explain store accounting procedure.
2. Mention the guidelines for some of the important building materials. 2012(W)

3. Self Practice

Group - A

1. Define stock store.
2. What do you mean by inventory control?
3. Name the two methods of stock control.

Group - B

1. Explain the purposes of inventory control.
2. How are surplus materials disposed of?

Group - C

1. Describe the various stages of material management.