

## 32.0 Medical Logistics

### 32.1 Introduction

#### 32.1.1 Description

The Medical Logistic Center or the Medical Warehouse provides an area to store medical equipment consumables and disposables, equipment assembly centers and pharmaceutical products. Warehouses shall be designed to accommodate the variety of sensitive materials to be stored, the associated handling equipment, the receiving and shipping operations and associated trucking, as well as the needs of the operating personnel.

Medical logistic centers includes

- General warehouse
- Special warehouse.

The General warehouse shall accommodate the medical equipment, instruments, medical furniture and other materials that do not require a 'sterile area'. The warehouse should have the required provision in the facility for assembling the equipment.

The Special Warehouse shall accommodate the sensitive materials and includes medicines, drugs, consumables and other materials which need to be stored in a clean area.

Facilities must provide a proper environment for the purpose of storing goods and materials that require protection from the elements. The height of the building, size, service requirements and structural complexity are the common factors which affect the construction of a warehouse.

### 32.2 Planning

#### 32.2.1 Planning Models

Classification of Materials

The Warehouse Unit will consist of the following units depending on the materials stored inside the facility.

- Medical Furniture and Minor and Major Biomedical Equipment
- Medical Instruments
- Medicines, Drugs, fluids, consumables, reagents and dressings materials
- Medical Gases.

Functional Areas

The warehouse shall have the following Functional Areas:

- Loading Dock
- Goods Receipt
- Dispatch
- Storage which may include bulky goods, palletted supplies, flammable equipment, furniture and equipment and gas bottles
- Staff areas including Offices, Workstations and access to Staff Change and Toilets.

The storage area for various materials shall be designed in order to meet the following conditions.

- The area should be clean and dry
- The area should be suitably spaced to allow cleaning and inspection
- All surfaces and shelves should be made of/covered by an impermeable material to enable proper and safe cleaning
- Areas should be adequately lit and ventilated in order for tasks to be performed in a correct and safe manner
- Floor space can accommodate oversized items or the racking configured to store palletized products
- Firefighting equipment should be easily available. Large supplies of flammables should never be stored in the same areas as medicines.

#### General Considerations

General Considerations for the Medical Warehouse include the following:

- The warehouse shall include the Eyewash stations, fire extinguishers and emergency exits
- High volume low speed (HVLS) fans shall be installed to keep the ventilation effectively
- High speed doors, which open as quickly as eight feet per second, to allow workers and products to keep moving without any delay
- A dock leveler installation must be positioned to stabilize trucks at the loading dock. The leveler will keep the truck straight and secure so that the workers can get on and off the truck with ease
- The roads should be designed for easy movement of trucks. Provision should be made for parking, loading and unloading activities
- The loading and unloading of materials shall have separate vehicle bays. The loading dock shall be designed to safely accommodate the required number of trucks
- Automated or Semi-automated cranes shall be used in order to transfer the materials effectively
- Loading Dock shall be a covered area for transport access to service Units for delivery or collection of goods and shall be zoned into clean and dirty areas. This may be shared between a number of Support Service Units (e.g. Catering Unit, Linen Handling, and Supply Unit).

#### Special Storage Area

- The sensitive materials or medicines shall be stored in an access controlled environment. Sensitive medicines include narcotics, sedatives, hypnotics, opium preparations, psychotropic medicines and strong analgesics. Refer to the Ministry of Health Formulary Drug List for further information
- Some flammable liquids including acetone, anesthetic ether, alcohols (before dilution) shall be stored in a separate location away from the main storeroom, preferably outside the main storeroom but on the premises and not less than 20m away from the other buildings
- Corrosive or oxidant substances including (but not limited to) acids, alkalis, ammonia solutions and nitrate solutions shall be stored away from flammables, ideally in a separate steel cabinet to prevent leakage. Appropriate industrial-type protective gloves and eyeglasses must be used when handling these items
- In the warehouses, use of cool rooms may be more efficient rather than numerous refrigerators or freezers. Larger facilities should have one cool room with a negative temperature for frozen products (-20°C) and another room with a positive but cold temperature (2°- 8°C) for products requiring refrigeration.

### 32.2.2 *Operational Models*

#### General

#### Goods Receipt

The warehouse shall have a dedicated Goods Receipt area for the receipt, checking, sorting and temporary holding of incoming stock. Goods Receipt will require off street unloading facilities. The Goods Receipt shall be located near to the Loading Dock with easy access to the Bulk Store.

#### Dispatch Area

The Dispatch Area shall be designed to manage the range of items that are delivered or collected by external suppliers. It shall be located with easy access to the Loading Dock.

#### Storage Area

The storeroom and shelves shall be arranged with sufficient space in order to mobilize the materials internally. An area shall be provided for pallets holding cartons as follows:

- At least 10cm (4 inches) off the floor
- At least 30cm (1 foot) away from the walls and other stacks
- Not more than 2.5m (8 feet) high

The Storage area shall be segregated into two clusters namely, bulky items and medical equipment storage. The Storage Areas Capacity shall be determined based on the scope of the services and operational policy of the hospital. Stock items shall be stored in heavy duty shelving or on clean pallets. Based on the requirements, Cool Rooms or refrigerators shall be required for the items which must be stored at cooler temperatures. Sterile items shall be stored separately from non-sterile items. Sterile items are to be stored in shelving which is a minimum of 250mm from the floor and ceiling. Intravenous fluids shall be stored in a designated area within the Bulk Store.

The equipment storage area is used for the storage of medical equipment and furniture. The storage space shall have specific provision based on the type of medical equipment and furniture to be stored.

#### Administrative Office

The Administrative Office shall consist of the following:

- Workstations with computer
- Meeting Room for porters awaiting assignment
- Store Room for potage trolleys
- Pantry
- Toilets (Male and Female separate)
- Utility room.

#### Security

The facility should include a security system including trained security personnel, CCTV and safety lockers as required. For special zones, an access control system shall be incorporated. The Security Unit will operate 24-hours every day of the year.

#### Staffing

The warehouse may include the following staff for efficient operation depending on the operational policy:

- Warehouse Manager
- Store Keepers
- Accountant
- Pharmacist
- Drivers
- Material handling labor
- Security staff.

#### Operating Hours

The Warehouses will operate during the business hours. It will provide an after-hours emergency services and support with limited entry provisions after-hours.

### 32.2.3 *Functional Relationship*

#### External

The warehouse shall have exclusive access to external roads, in order to avoid traffic congestion.

#### Internal

The storage areas for all delivered supplies shall be located with ready access to the Loading Dock area. This area requires security and controlled access.

## 32.3 Design

### 32.3.1 *General*

A special attention should be given to the following parameters irrespective of the size of the warehouse.

#### Roof

Slanting roof shall be installed to allow rain water drainage. The roof shall be extended over the windows to provide protection from rain and direct sunlight.

#### Ceiling

A double ceiling shall be installed to provide insulation and to ensure supplies are maintained at the required temperature.

#### Walls and Floors

The walls and floors of the warehouse should be permanent and smooth for easy cleaning. Walls shall be constructed of brick or concrete blocks. Perforated or bored bricks may be used for the upper portion of the wall to allow ventilation, but these should be screened to prevent the entry of rodents and other pests. The floor shall be constructed or treated to ensure it can withstand frequent movement of heavy products and equipment.

#### Doors

The doors should be wide enough to allow easy movement of supplies and equipment. Large facilities often use forklifts and other handling equipment. Ensure that the doors are strong and reinforced to provide adequate security. Two strong locks, and install metal grills for extra protection should be ensured.

#### Windows

The windows should be high and wide to allow adequate ventilation. The location of windows should avoid obstruction by shelves. Windows shall be secured against intrusion and protected with wire mesh to keep out insects.

#### Ventilation

The warehouse shall be designed to ensure maximum air circulation in order to avoid concentration of fumes or gases and to prevent condensation of moisture on products or walls. Extractor fans may be used to remove fumes, gases, and moisture.

### Lighting

The storeroom should be provided with as much natural daylight as possible to avoid the use of either florescent or incandescent bulb lighting. Florescent lighting emits ultraviolet rays, which have a negative effect on certain products. Incandescent bulbs emit heat.

### Cupboards

Cupboards shall be provided to store the specific products that must be kept free from dust or light.

### Shelves

The shelves and racks should be arranged in rows with a passageway of not less than 90 cm wide and should be adjustable in height. The arrangement of shelving should provide for maximum efficiency and avoid wasting of space; ideally access should be provided to both sides of shelving. Shelves, cupboards, tables, and pallets must be heavy duty construction and materials.

### First Aid

A first aid kit should be available to treat employees or visitors who are injured in the facility. The first aid kit shall be placed in a central location that is easily accessible to all employees and clearly marked.

### Waste

The facility will generate different types of waste that must be held and destroyed safely including the following:

#### Non-medical waste

- Cardboard cartons: cardboard shall be recycled or treated as ordinary rubbish
- Garden rubbish: Compost leaves, sticks, weeds, and trimmings from shrubs and trees, if feasible. A separate area shall be designated for composting
- General waste: Where municipal solid waste facilities exist, dispose of ordinary rubbish in the municipal dump. Otherwise, burn or bury it.

#### Healthcare waste

- Sharps waste: Single-use disposable needles, needles from auto-disable syringes, scalpel blades, disposable trocars, sharp instruments requiring disposal, and sharps waste from laboratory procedures.
- Other hazardous medical waste: Waste contaminated with blood, body fluids, human tissue; compounds such as mercury; pressurized containers; and wastes with high heavy metal content.
- Pharmaceuticals: Expired, damaged, or otherwise unusable medicines and items contaminated by or containing medicinal substances.

## 32.4 Components of the Unit

Medical Logistics shall contain Standard Components according to the level of service. Provide the Standard Components to comply with details that are described in these guidelines.

### 32.5 Schedule of Accommodation

#### Typical Medical Logistics Unit suitable for a tertiary level facility

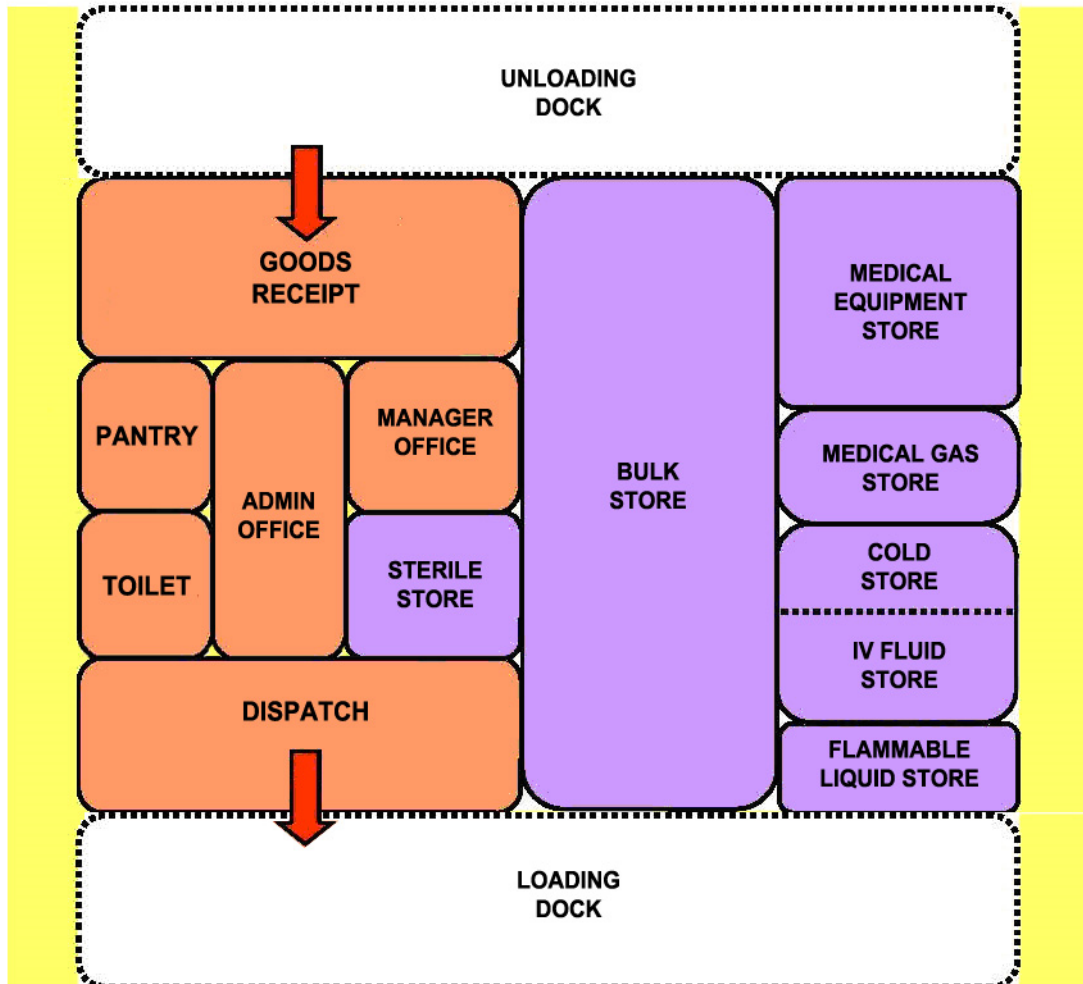
ROOM/ SPACE	Standard Component							Level 5/6 Qty x m <sup>2</sup>	Remarks
<b>Medical Logistics Areas</b>									
Loading Dock	LODK-SJ							1 x 0	Covered external area; separate zones for clean/ dirty loading
Staff Base	SSTN-20-SJ							1 x 20	Supervision of Loading Dock
Waiting	WAIT-10-SJ Similar							1 x 5	
Goods Receipt- Sorting/ Holding/ Unpacking								1 x 50	Direct access to Loading Dock
Dispatch								1 x 30	Goods sending - Direct access to Loading Dock
Store - Filing/ Photocopy	STPS-8-SJ							1 x 8	Locate in Goods Receipt
Workstations - Stores Distribution	OFF-WS-SJ							1 x 32	8 workstations; qty dependent on no. of staff
Store - Consumables	STBK-20-SJ Similar							1 x 400	Size dependent on amount of stock to be stored
Store - High Value Items	STBK-20-SJ Similar							1 x 250	Secure area; Size dependent on amount of stock to be stored
Store - Consignment Items	STBK-20-SJ Similar							1 x 100	Secure area; Size dependent on amount of stock to be stored
Store - Flammable Liquid	STFL-SJ Similar							1 x 15	
Store - IV Fluids	STGN-50-SJ							1 x 50	
Store - Sensitive Materials (Drugs)	STDR-5-SJ Similar							1 x 10	May be located in the Pharmacy Unit
Store - Gas Bottles	STGN-20-SJ Similar							1 x 30	May be located externally at a Secure location
Bay - Emergency Shower with Eyewash								1 x 2	Accessible to storage areas
<b>Purchasing</b>									
Office - Manager (Purchasing)	OFF-S9-SJ							1 x 9	
Office - Workstation	OFF-WS-SJ							6 x 4	
Meeting Room	MEET-L-15-SJ							1 x 15	Meetings with company representatives, staff
Store Room - Sample	STBK-20-SJ							1 x 20	Holding of samples and trial products
<b>Staff Areas</b>									
Staff Room	SRM-25-SJ							1 x 25	
Toilet - Staff	WCST-SJ							2 x 3	
Change - Staff								2 x 12	Toilets, shower, lockers, Separate Male/Female areas
Security Room	SECR-10-SJ Similar							1 x 50	With monitoring screens and controls
<b>Net Department Total</b>								<b>1178</b>	
<b>Circulation %</b>								<b>10</b>	
<b>Grand Total</b>								<b>1295.8</b>	

#### Notes:

- Areas noted in Schedules of Accommodation take precedence over all other areas noted in the FPU
- Rooms indicated in the schedule reflect the typical arrangement according to the Role Delineation
- Exact requirements for room quantities and sizes will reflect Key Planning Units identified in the Service Plan and the Operational Policies of the Unit
- Room sizes indicated should be viewed as a minimum requirement; variations are acceptable to reflect the needs of individual Unit

- Office areas are to be provided according to the Unit role delineation and staffing establishment; Executives and Managers may be responsible for more than one area but should have only one office assigned within the campus
- Staff and support rooms may be shared between Functional Planning Units dependent on location and accessibility to each unit and may provide scope to reduce duplication of facilities.

### 32.6 Functional Relationship Diagram





## 32.7 Further Reading

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