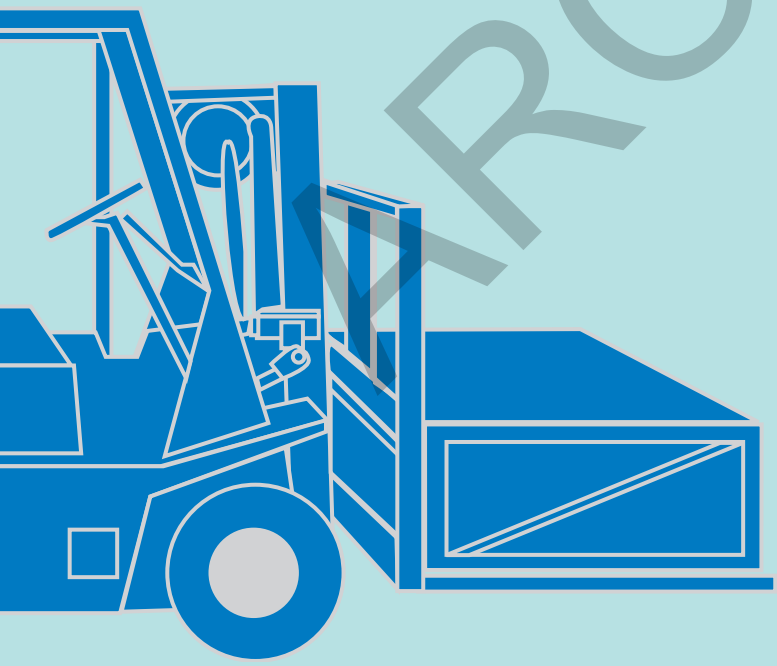
AIR MOBILITY COMMAND

SUPPLY ADMINISTRATION AND WAREHOUSE FACILITIES DESIGN GUIDE



In providing "Responsive Global Reach for America…Every Day," AMC depends on the support of the hard working professionals in our supply squadrons, and they deliver! In turn, those people must have the right kind of facilities in which to do their mission.

This Guide sets the standards for planning, programming, and designing the work needed to upgrade our existing supply facilities and build new ones. As AMC modernizes these facilities, it will reap big dividends in the morale and productivity of its troops and the vital mission they perform.

"The Air Mobility Team…Responsive Global Reach for America…Every Day!"

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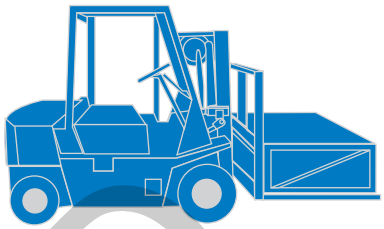


A. Purpose

This guide provides the basic criteria to evaluate, plan, program, and design Air Mobility Command (AMC) supply administration and warehouse facilities. It is intended to make commanders and their staffs aware of important design considerations and to aid in project development.

Planning and programming for supply administration and warehouse facilities should consider all aspects of the operation of a Standard Base Supply System (SBSS). Additionally, a quality design will maximize effective use of available space and provide efficient supply administration and warehouse facilities.

B. Design Guide Scope and Use

This guide applies to the design of all new construction and renovation projects for supply administration and warehouse facilities. It provides the overall criteria for determining requirements, site evaluation and planning, and design of exterior and interior areas.

Use this guide to supplement other Air Force and Department of Defense (DoD) policies and instructions to identify individual construction project requirements. The Requirements and Management Plan (RAMP) defines the program for design of an individual Military Construction (MILCON) project. It includes functional requirements, design criteria, and cost information. The material in this guide provides the basis for preparing the RAMP.

1. Project Initiation

Information required for preparation of the DD Form 1391, which initiates project development, is found in Chapter 2. This includes considerations of the space criteria to determine overall building size, site evaluation, and special factors to be used in the cost estimates.

2. Site Selection

This is generally part of the master planning process. It is completed prior to preparing a DD Form 1391 for an individual project. However, project programming requirements developed in the DD Form 1391 phase may require a re-evaluation of site selection decisions. For guidance in evaluating sites for a project, see Chapter 2, Section E, Site Evaluation.

3. Design

a. The design of a project is typically developed in progressive phases, i.e., planning and programming, concept and preliminary drawings, and final working drawings. Design guidance for all of these design phases is covered in Chapters 2 through 4.

b. Chapter 2 provides basic planning and programming criteria, along with tables for determining square footage requirements.

c. Chapter 3 presents concept and preliminary design considerations such as the location of a facility on a site, the design of the facility and support utilities, as well as specific technical guidance.

d. Chapter 4 addresses specific design issues concerning individual functional areas, which are important for preliminary and working drawings. In this chapter, illustrative designs and photographs help clarify the design guidance of the preceding chapters.

4. Interior Finishes and Furnishings

Chapter 5 provides recommendations for selection of interior materials, finishes, and colors. Carefully selected interior finishes and furnishings are essential for a quality design.

C. Supply Administration and Warehouse Facilities

See Figure 1-A for functional area relationships of the administration and warehouse facilities.

a. This facility comprises six components:

- Administration
- General purpose storage
- Retail sales
- Mobility
- Hazardous materials pharmacy
- Outside storage

b. Administrative space requirements normally include private supervisory offices, conference/training space, open office areas (staff), administrative support (reproduction, work area, computer workstations, and file areas), rest rooms, break areas, and utility space.

c. General purpose storage requires space for bulk and bin storage of materials, aisles, receiving and shipping, packing and crating, equipment storage and issue, and general supply and base issue.

d. The retail sales function is responsible for direct sales or issue of individual equipment, tools, and expendable supplies to base customers.

e. The mobility section is responsible for all functions involved in the management of mobility bags (individual equipment items) and small arms. This responsibility includes preparing, accounting for, storing, reporting, and issuing bags and small arms.

f. The hazardous materials pharmacy's mission is to provide a single point of control and management of the procurement, distribution, and disposal of all hazardous materials, except for medical. A fully functional and properly configured facility will provide quicker response for mission essential materials and a reduction in the hazardous materials and waste management responsibility placed on customers' organizations.

g. Outside storage is a fenced, paved and lighted storage yard for open and covered storage of bulk items and equipment. ■

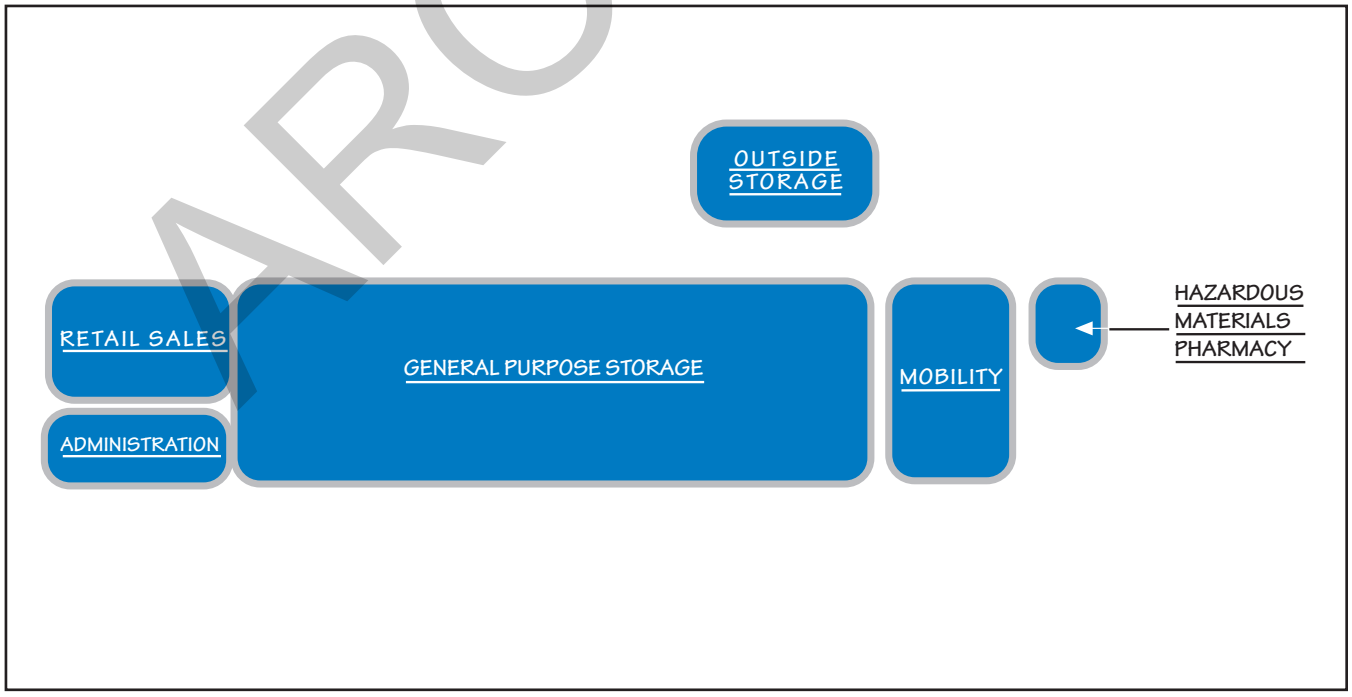
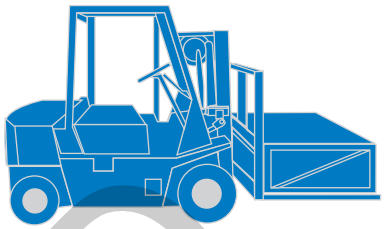


Figure 1-A: Functional Area Relationships for the Administration and Warehouse Facilities.

Chapter 2

Program



A. General

1. Planning and Programming Considerations

a. Planning, programming, and designing a supply administration and warehouse facility normally requires extensive coordination. This coordination is important because of the different organizations involved in developing facility requirements.

b. Personnel likely to have facility planning and design inputs are:

- Wing commander
- Wing safety officer
- Operations group commander
- Logistics group commander
- Support group commander
- Supply squadron commander
- Communications squadron commander
- Civil engineer squadron commander
- Security police squadron commander

2. Supply Administration and Warehouse Facilities

Requirements for supply administration and warehouse facilities can be broken into two categories as follows:

a. Administration

- Command activities
- Central administration
- Customer services
- Support spaces

b. Warehouse

- General purpose storage
- Retail sales
- Mobility
- Hazardous materials pharmacy
- Outside storage

B. Administrative Functions

1. Command Activities

a. Chief of Supply (COS) - A private office for the supply squadron commander adjacent to the conference room.

b. Deputy Chief of Supply - A private office adjacent to the COS.

c. Secretary/Waiting Area - An open office adjacent to the COS's office, used for guest waiting and secretarial functions.

d. Kitchenette/Coat Closet - A small room between the secretary/waiting area and the conference/training rooms, featuring a coffee bar, wet sink, and coat closet.

e. Conference/Training Rooms - These rooms are divided by a folding partition which provides good sound insulation. The training room is used for training supply customers and in-house groups. Included in the space is a rear screen projection room for audiovisual equipment and storage.

f. Orderly Room - Centrally located office that handles most of the squadron's administrative and personnel actions. The first sergeant and the squadron section commander are located in the orderly room.

2. Central Administration

a. Funds Management - Manages all funding for the COS.

b. Supply Administration - Responsible for the management of all office administrative functions, such as correspondence from branches, distribution of publications, maintaining current files of regulations and manuals, etc.

c. Inventory - Responsible for inventory of all items for which the COS is accountable.

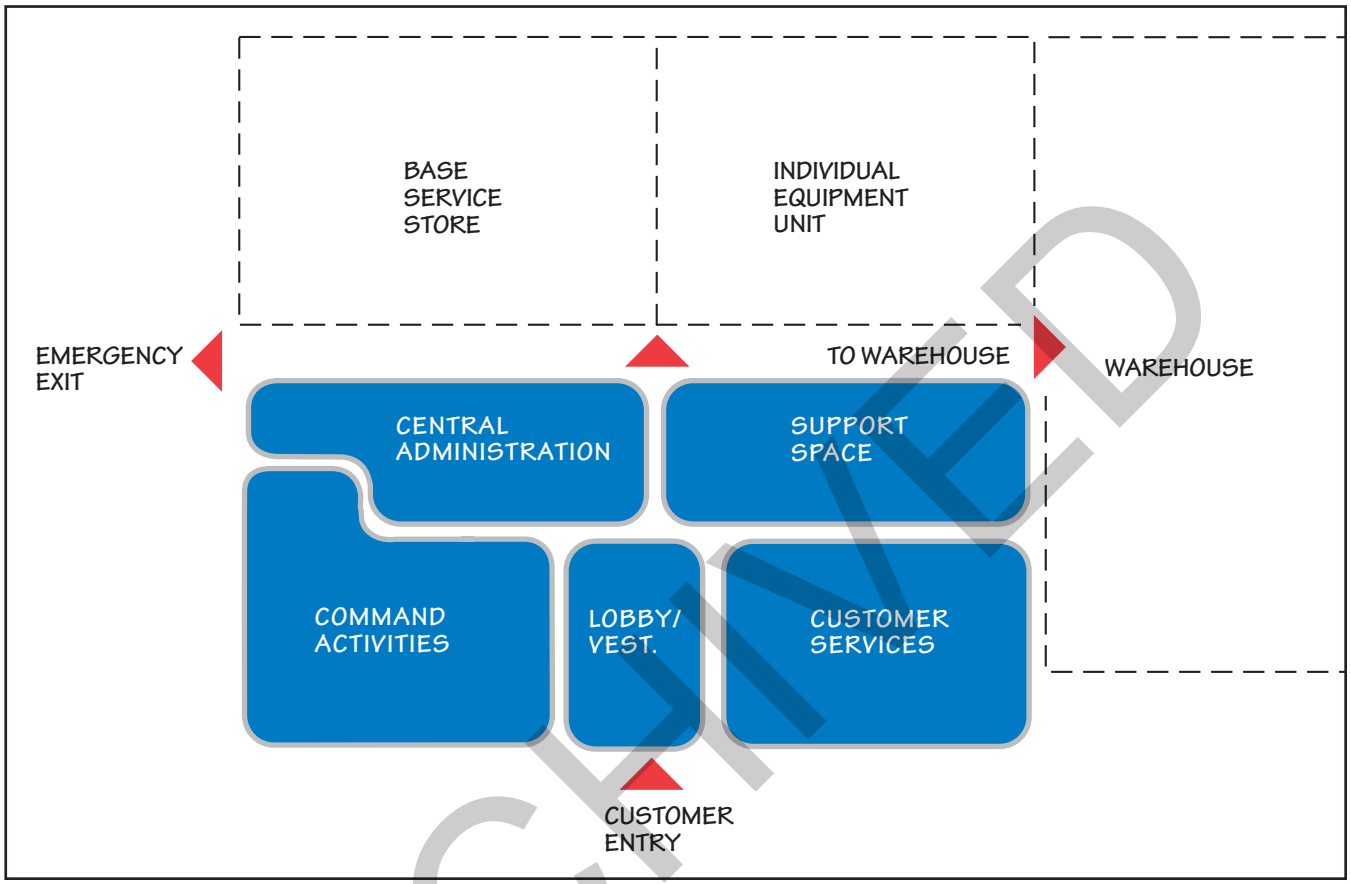


Figure 2-A: Functional Area Relationships for the Supply Administration Area.

d. Procedures and Analysis - Responsible for seeing that the SBSS operates according to documented policies and procedures.

e. Document Control - The final document quality control checkpoint in the base supply system. Also maintains document and report files to support COS accounting requirements.

f. Computer Operations - Composed of Automated Data Processing Equipment (ADPE) element and associated personnel.

g. Stock Control - Personnel inform the materials management officer about management of data that influences the effectiveness and efficiency of operations.

h. Equipment Management - Manages all equipment items other than vehicles.

i. Officer-In-Charge/Non-Commissioned Officer-In-Charge (OIC's/ NCOIC's) Offices - Individual offices for officers and NCOs in charge of various administration branches.

3. Customer Services

a. Customer Services/Training - Provides a single point of contact for customer assistance and is responsible for training supply customers.

b. Demand Processing - Responsible for the effective and efficient operation of the research and records maintenance units.

4. Support Spaces

a. Vestibule/Lobby - Area for access and orientation to public areas for visitors and customers.

b. Rest Rooms - For public use; areas must be accessible by the disabled.

c. Break Room - An area for personnel to take a break, relax, and enjoy a snack in a relaxing environment. An outdoor patio may be included.

d. Janitor's Closet - Area for mop sinks and storage of maintenance supplies.

e. Mechanical Room - Space for heating, ventilating and air conditioning equipment (HVAC), electrical service, and fire detection and alarm equipment.

f. Communications Room - Location for telecommunications systems and telephone switching equipment.

C. Warehouse Functions

1. General Purpose Storage

a. Receiving - Receives incoming shipments from packing and crating.

b. Pickup and Delivery - Picks-up or delivers supplies and equipment, except for retail sales items and routine bench stock issues, to customers.

c. Battery Charging Area - Space large enough to accommodate four to five battery-operated turret trucks.

d. Inspection - Inspects items received, stored, issued, shipped, and transferred to determine the condition, security classification, and identification.

e. Storage and Issue - Stores all in-warehouse supply and equipment items (except retail sales and mobility). Also responsible for processing of items to be issued, shipped, or transferred.

f. Packing and Crating - This section is a part of the transportation management office, which is responsible for receiving all deliveries, processing and shipping all out bound freight, and cargo packing and crating.

g. OIC's/NCOIC's Offices - Individual offices for officers and NCOs in charge of various warehouse branches.

h. Break Room - An area for personnel to take a break, relax, and enjoy a snack in a relaxing environment.

i. Rest Rooms - For public use; areas must be accessible by the disabled.

j. Janitor's Closet - Area for mop sinks and storage of cleaning and maintenance supplies.

2. Retail Sales

a. Individual Equipment Unit (IEU) - Operates centralized issue, storage, and turn-in points for all items authorized for issue to personnel based on their Air Force Speciality Code or duty. These items include common items, special clothing, and field equipment.

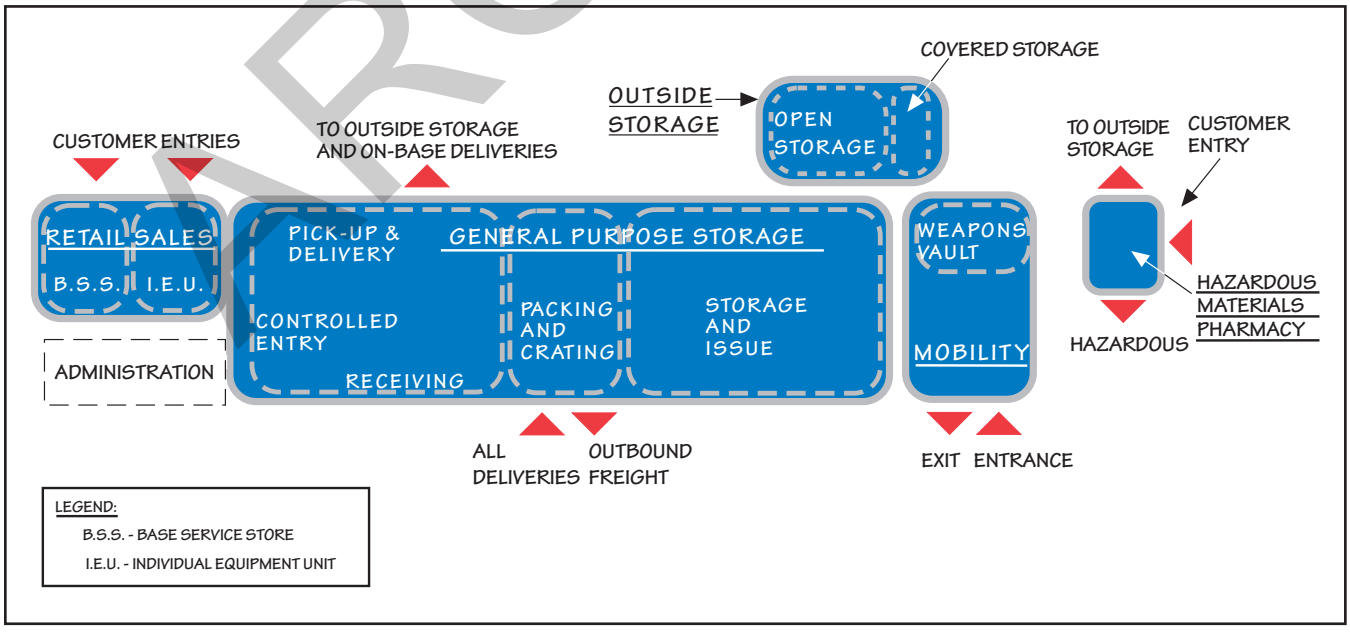


Figure 2-B: Functional Area Relationships for the Warehouse.

b. Base Service Store (BSS) - Performs storage and issue of hand tools, warranted tools, and administrative supplies.

c. Administration Office - The primary area for record keeping, billing, operational, and administrative needs.

d. OIC's/NCOIC's Offices - Individual offices for officers and NCOs in charge of various BSS and IEU functions.

e. Dressing Rooms - Three individual spaces for fitting of clothing items.

3. Mobility

a. Mobility Bag Storage - Stores and issues mobility baggage (individual equipment items).

b. Weapons Vault - Stores, issues, ships, and transfers weapons (including mobility and base defense weapons).

c. OIC's/NCOIC's Offices - Individual offices for officers and NCOs in charge of various warehouse branches.

d. Administration Office - The primary area for record keeping, billing, operational, and administrative needs.

e. Rest Rooms - For public use; areas must accessible by the disabled.

4. Hazardous Materials Pharmacy

a. Staging and Segregation - Used for inspecting, receiving, and cataloging hazardous materials shipped to the pharmacy in bulk form. Delivery vehicles range from small general purpose vehicles to 18-wheel tractor trailer vehicles and lowboy trailers.

b. Hazardous Materials and Flammable Storage - Holds flammable, combustible, reactive, corrosive, and toxic materials in accordance with Occupational Safety and Health Act standards.

c. Hazardous Waste Accumulation Point - Provides short-term (less than 90 days) storage for hazardous waste.

d. Reutilization - Holds unused material returned to the pharmacy for possible reuse or recycling.

e. Customer Service - Serves as the customer service pickup area. The customer receives the requested material, material safety data sheet, and receipt. It is also used for pre-delivery staging of outgoing material, incoming empty containers, and unused material.

f. Manager's Office - This is a private office for the OIC's/NCOIC's to oversee the operations of the hazardous materials pharmacy. It is located within the administration office space.

g. Administration Office - Provides space for the stock control administrator and waste controllers.

h. Rest Rooms/Lockers - Areas must be accessible by the disabled and should accommodate up to 16 employee lockers.

5. Outside Storage

a. Open Storage - A fenced, paved, and lighted area that provides storage space for large bulk items not suitable for storage in the warehouse.

b. Covered Storage - Space to store supplies, equipment, and materials not requiring closed warehouse space, but requiring covered protection from the weather. Covered storage space is constructed without complete sides and end walls. In colder climates, this space may be included inside the warehouse.

D. Space Criteria

1. Planning Considerations

a. Define the size, type, number, and functional area relationships required to support the supply administration and warehouse facilities.

b. Development of the space criteria should take into consideration the existing facilities relative to current and future needs.

2. Standard Facility Requirements

a. The overall size of the supply administration and warehouse facilities depends on the base population.

b. Many areas within the overall facility have specific space requirements which are outlined in Tables 2-B through 2-F. These functional areas are graphically illustrated in Figures 2-A and 2-B on pages 4 and 5. The space that remains between the specified areas and the total is general

purpose warehouse space, which is addressed in Table 2-G. The warehouse space includes several functions which can be adjusted *without facility modification* within the general purpose warehouse floor space.

- Table 2-A: Gross Square Footage Calculation for a Typical Supply Administration and Warehouse Facility - Use the formula to calculate the overall gross square footage of a hypothetical supply facility based on an average base population of 6,000 personnel.
- Table 2-B: Gross Square Footage Calculation for Outside Storage - Use the formula to determine square footage requirements for open and covered storage.
- Table 2-C: Functional Space Requirements for the Administration Area - This area supports the overall administration function.
- Table 2-D: Square Footage Requirements for the Retail Sales Area - Use the formula in this table to determine square footage requirements for the retail sales area, including the BSS and IEU areas.
- Table 2-E: Functional Space Requirements for Mobility - Area requirements for mobility, include mobility bag storage, weapons vault, administration offices, cleaning and clearing and rest rooms. A formula is included to determine square footage requirements.
- Table 2-F: Square Footage Requirements for the Hazardous Materials Pharmacy - Area for staging and segregation, hazardous materials and flammable storage, hazardous waste accumulation point, administration, reutilization, customer service manager's office, and rest rooms/lockers are provided.
- Table 2-G: Square Footage Requirements for the Warehouse Area - Use this table to determine square footage requirements for general purpose and support areas for receiving, pickup and delivery, inspection, storage and issue, packing and crating, and support functions.
- Table 2-H: Square Footage Requirements for the Supply Administration and Warehouse Facility - This table is a compilation of the net square footages of the components that make-up the overall facility plus calculation of circulation space.

E. Site Evaluation

1. Location

Locate supply administration and warehouse facilities with access from major base roadways. This facility should be located near the center of the base to best serve its customers.

2. Size

a. Site size depends upon gross building square footage, space required for access, maneuvering and parking of tractor trailers, and space required for access and parking of government owned vehicles (GOVs) and privately owned vehicles away from the major roadways.

b. Prior to the preparation of the DD Form 1391, preliminary site design should be performed to ensure basic building and site criteria can be accommodated. The topography of the selected site should be relatively flat.

F. Special Project Costs

Special factors should be considered when establishing initial estimates of project costs (see relevant sections of Chapters 3 and 4). Considerations may include:

- Weather Conditions - Evaluate local wind, snow, and seismic conditions for their impact on project costs.

Gross SF Calculation for a Typical Supply Administration and Warehouse Facility

Formula for Supply Administration and Warehouse Facility:

Assume an average base population of 6,000 people

- 35 SF per person for populations between 1 and 4,000
- 15 SF per person for additional population over 4,000 people

Example:	35 SF x 4,000 =	140,000 SF	13,006 SM
	+15 SF x 2,000 =	30,000 SF	2,787 SM
	Total =	170,000 SF	15,793 SM

Table 2-A: Gross Square Footage Required for a Typical Supply Administration and Warehouse Facility.

Gross SF Calculation for Outside Storage—Open and Covered

Formula for Open Storage and Covered Storage:

Assume an average base population of 6,000 people

- Use 7 SF per person for open storage space(1)
- Use 1 SF per person for covered storage space(1)

Example:	7 SF x 6,000 =	42,000 SF	3,902 SM
	1 SF x 6,000 =	6,000 SF	557 SM
Gross Total Outside Storage =		48,000 SF	4,459 SM

Table 2-B: Gross Square Footage Required for the Outside Storage Area.

Functional Space Requirements for Administration

Command Activities	SF	SM
Chief of Supply	200	19
Deputy Chief of Supply	200	19
Secretary/Waiting Area	250	23
Kitchenette/Coat Closet	80	7
Conference/Training Room(2)	1,650	153
Orderly Room	180	17
Squadron Section Commander	150	14
First Sergeant	150	14
Net Subtotal Command Activities	2,860	266*

Central Administration	SF	SM
Funds Management	180	17
Supply Administration	180	17
Inventory	450	42
Procedures and Analysis	450	42
Customer Services/Training	450	42
Document Control	270	25
Computer Operations	810	75
Demand Processing	450	42
Stock Control	900	84
Equipment Management	450	42
Net Subtotal Central Administration	4,590	428*

Support Areas	SF	SM
Rest Rooms(3)	408	38
Janitor's Closet	50	5
Break Room(4)	800	74
Mechanical Room(5)	720	67
Communications Room	150	14
Net Subtotal Support	2,128	198*
Net Total Administration	9,578	890*

Formula for Administration Area:

Assume an average of 64 administrative personnel at 150 SF per person

Example:

- 150 SF x 64 = 9,600 gross SF

For office areas assume 90 SF per person

Example:

Stock control has 10 people

- 10 people x 90 SF per person = 900 SF

Legend for Tables 2-A, 2-B, and 2-C.

SF - Square Footage

*SM - Square Meters = .0929 x SF (All measurements are rounded)

(1) If covered and open storage space is required by on-base organizations, such as civil engineering, requirements should be determined locally.

(2) Square footage is based on 75 seats at 18 SF per seat plus 300 SF projection room.

(3) Square footage is based on National Plumbing Code for occupancy and number of fixtures for up to 100 people.

(4) Square footage is based on 45 seats at 15 SF per seat, plus vending area.

(5) Square footage is based on 7 to 8% of the gross admin. square footage.

Table 2-C: Functional Space Requirements for the Administration Area.

- Preliminary Soil Analysis - Determine whether specialized site and foundation work will be required.
- Structural Loads - Assess loads to determine any specific design costs, especially for high-bay clear spans.
- Zone Controls - Functional areas may require different environmental conditions, based on function or hours of operation. Zone controls can be used to satisfy these individual environmental requirements for a facility.

Functional Space Requirements for Retail Sales

Area	SF	SM
Base Service Store		
OIC's/NCOIC's Offices	150	14
Administration Office	150	14
Display and Storage Areas(1)	10,700	994
Net Subtotal Base Service Store	11,000	1,022*
Individual Equipment Unit		
Dressing Rooms 3 @ 20 SF	60	6
OIC's/NCOIC's Offices	150	14
Administration Office	150	14
Display and Storage Areas(1)	10,640	988
Net Subtotal Individual Equipment Unit	11,000	1,022*
Net Total Retail Sales	22,000	2,044*

Formula for Retail Sales Areas:

- Calculation applies to B.S.S. and I.E.U.
- Based on average base population of 6,000 people

Base Population	SF(2)	SM(2)
1 to 4,000	2.5	.2323
4,001 to 8,000	.5	.046
Over 8,000	.3	.02787

Example:

4,000 x 2.5 SF =	10,000 SF	929 SM*
2,000 x 0.5 SF =	1,000 SF	93 SM*
Total =	11,000 SF	1,022 SM*

Table 2-D: Square Footage Requirements for the Retail Sales Area.

Functional Space Requirements for Mobility

Area	SF	SM
Mobility Bag Storage	17,592	1,634
Weapons Vault	2,400	223
OIC's/NCOIC's Offices 2 @ 150 SF	300	28
Administration Office	300	28
Rest Rooms(3)	408	38
Net Total Mobility	21,000	1,951*

Formula For Mobility: Assume an average Mobility commitment of 6,000 people

Mobility Commitment	SF(2)	SM(2)
1 to 4,000	.5	.465
4,001 to 8,000	.5	.046
Over 8,000	.3	.02787

Example:

4,000 x 5 SF =	20,000 SF	1,858 SM*
2,000 x 0.5 SF =	1,000 SF	93 SM*
Total =	21,000 SF	1,951 SM*

Table 2-E: Square Footage Requirements for the Mobility Area.

Legend for Tables 2-D and 2-E.
SF - Square Footage
*SM - Square Meters = .0929 x SF (All measurements are rounded)
(1) Individual units may have specific requirements which drive an increase or decrease in space for specific functional areas. These deviations from this standard must be fully justified and documented during planning and programming of the facility.
(2) Square footage/square meters per person.
(3) Square footage is based on National Plumbing Code for occupancy and number of fixtures for up to 100 people.

Functional Space Requirements for Hazardous Materials Pharmacy

Area	SF	SM
Staging and Segregation(1)	1,005	93
Hazardous Materials and Flammable Storage(1)	2,820	262
Customer Service(1)	165	15
Manager's Office(1)	144	13
Administration Office(1)	756	70
Reutilization(1)	120	11
Hazardous Waste Accumulation Point(1)	2,820	262
Rest Rooms/Lockers(2)	375	35
Net Total Hazardous Materials Pharmacy	8,205	761*

Table 2-F: Square Footage Requirements for the Hazardous Materials Pharmacy Area.

Functional Space Requirements for Warehouse

General Purpose Storage Areas	SF	SM
Receiving(3)	(Refer to Space Criteria, paragraph D2b, page 6, for an explanation of square footage requirements)	
Pick-Up and Delivery(3)		
Battery Charging Area(3)		
Inspection(3)		
Storage and Issue(3)		
Packing and Crating(3)		
OIC's/NCOIC's Offices	900	84
Net Subtotal General Purpose Storage Areas	82,082	7,625*
Support Areas	**SF**	**SM**
Break Room(4)	800	74
Rest Rooms(2)	408	38
Janitor's Closet	50	5
Net Subtotal Support Areas	1,258	117*
Net Total SF Warehouse	83,340	7,742*

Table 2-G: Square Footage Requirements for the Warehouse Area.

Gross Total Functional Space Requirements for Supply Administration and Warehouse Facility

Area	SF	SM
Net Total Admin. (Table 2-C)	9,578	890*
Net Total Retail Sales (Table 2-D)	22,000	2,044*
Net Total Mobility (Table 2-E)	21,000	1,951*
Net Total Hazardous Materials Pharmacy (Table 2-F)	8,205	762*
Net Total Warehouse (Table 2-G)	83,340	7,742*
Net Total Inside Space	144,123	13,389*
Walls and Circulation (Inside Space 15%)(5)	21,618	2,008*
Gross Total Inside Space	165,741	15,397*
Gross Total Outside Storage (Table 2-B)	48,000	4,459*
Combined Gross Total	213,741	19,856*

Table 2-H: Space Requirements for a Typical Supply Administration and Warehouse Facility.

Legend for Tables 2-F, 2-G, and 2-H.

SF - Square Footage

*SM - Square Meters = .0929 x SF (All measurements are rounded)

(1) Square footage is based on the Air Force Center for Environmental Excellence Facility Planning and Design Guide, August 1993.

(2) Square footage is based on the National Plumbing Code for occupancy and number of fixtures for up to 100 people.

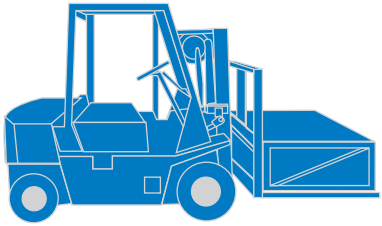
(3) Individual units may have specific requirements which drive an increase or decrease in space for specific functional areas. These deviations from this standard must be fully justified and documented during planning and programming of the facility.

(4) Square footage based on 45 seats at 15 SF per seat, plus vending area.

(5) 15% factor is typical for a warehouse type building.

Chapter 3

Overall Project Design



A. General

This chapter presents broad criteria for locating a supply administration and warehouse facility on a site, design of the facility and its supporting utilities, and technical requirements.

B. Site Design

1. Selection

a. See Figure 3-A for the site organization concept.

b. Locate the building on the site to provide a convenient main entrance and a separate access for trucks.

c. Building orientation should take into account the following factors:

- Protection from winds and glare
- Shade from excessive sun in warm climates
- Orient operable windows to take advantage of summer breezes
- Maximum sun exposure in cold climates

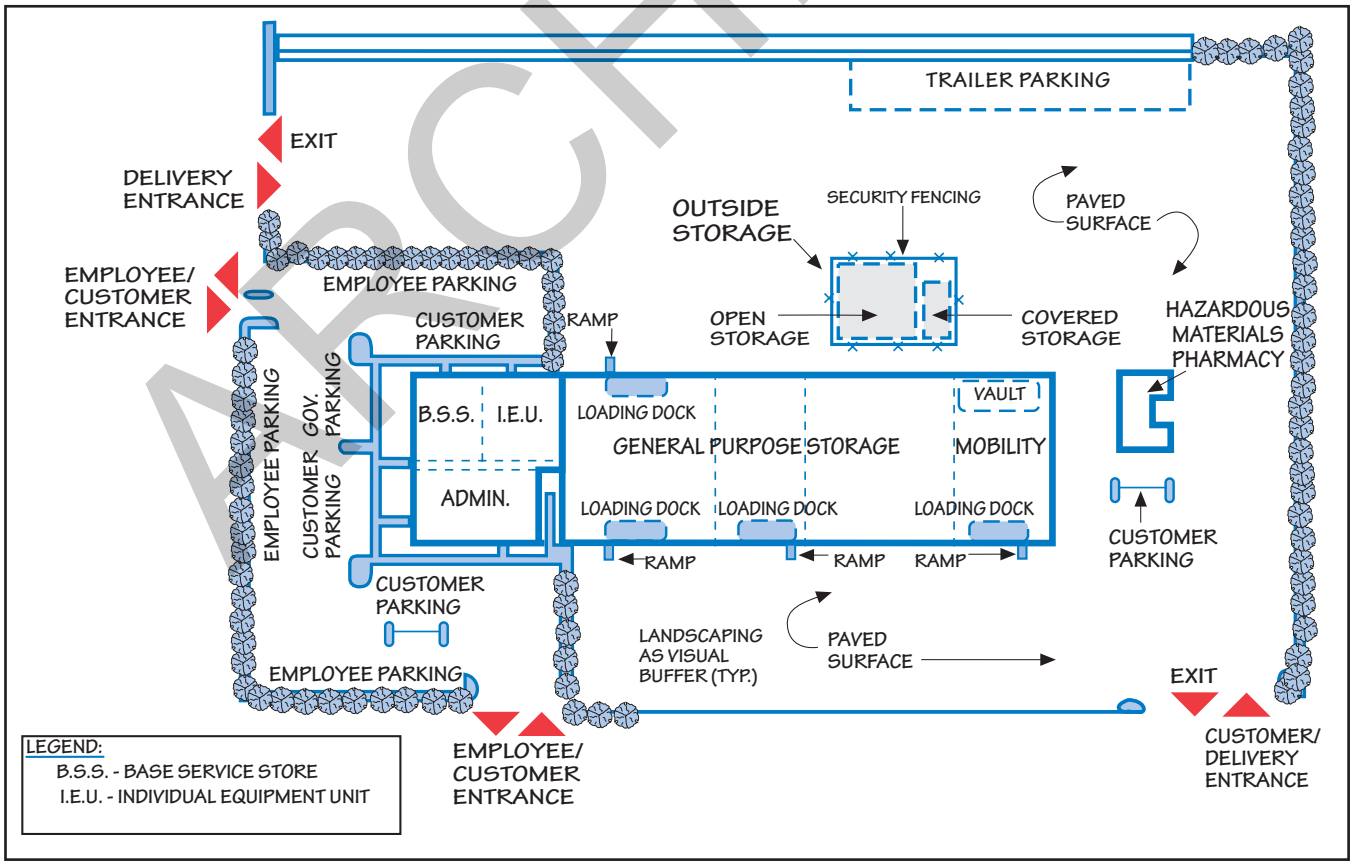


Figure 3-A: Site Organization for the Supply Administration and Warehouse Facilities.

2. Access

a. Provide a clearly identifiable access to the main entrance.

b. Service traffic should always be segregated from other traffic and pedestrian access. Keep traffic control signs to a minimum and use them only for safe integration of car and truck traffic into off-site street traffic.

c. Loading docks should be located for easy access by service vehicles and must be separate from the public entrances to the building.

d. Loading docks should accommodate the vehicles used to deliver/pick-up materials from the building. An adequate distance between the loading dock and local or site vehicle traffic should be maintained to ensure delivery/pick-up vehicles do not interfere.

3. Utilities

In accordance with local service procedures, provide:

- Water, sanitary sewer, and stormwater systems, plus natural gas, steam service, or fuel/oil systems
- Electric, telephone, sprinkler system, fire alarm, and communications systems

4. Landscaping

Use landscape elements to define the site and the main entrance. Landscaping should present an attractive image for the facility, as well as natural screening for separation between parking areas.

C. Building Design

1. Organization and Circulation

a. This facility is comprised of space for administration, warehouse, and command activities. Administration should be a separate area and located at one end of the facility.

b. The main entrance should provide direct access to the customer service office.

c. An open floor plan and internal circulation corridors should provide access to all administrative section areas. Internal corridors should have a minimum width of five feet to facilitate reconfiguration, and they should match the adjoining office space in ceiling height, ceiling material, and floor material.

d. Public access between the administrative offices and the warehouse should be restricted and access controlled to provide security.

e. The rest rooms should have centralized, prominent locations with easy access from the circulation corridors.

f. The general warehouse should consist of large, open bay areas for bulk and bin storage. The maximum storage height is 24 feet. Design cross-aisles wide enough for general purpose forklifts (68 inches wide), which will also accommodate special purpose vehicles, such as turret trucks (shown in photo on page 16).

g. Operating space for activities related to receiving, shipping, packaging, distribution, and counter service should have convenient access to a covered loading dock.

h. The hazardous materials pharmacy area should be a separate facility. It should be detached and/or separated from other buildings by at least 50 feet.

2. Architectural Character, Materials, and Finishes

a. The architectural and interior design of the facility should be strongly interrelated. The architectural style and form should be consistent with the base Architectural Compatibility Guide. The design team should use comprehensive interior design services to ensure interior finishes and furnishings are properly coordinated, as well as appropriate for each area. See Chapter 5 for suggested interior finishes.

b. Provide a variety of spaces and subspaces to accommodate different size groups and activities. Use modular systems furniture to economize on space, to provide flexibility, and to promote a sense of organization and visual order.

c. Consider the use of natural light whenever possible. Some areas that would benefit include the entrance corridor, the lobby, the orderly room, and the circulation corridors.

3. Flexibility and Expansion Potential

a. Design of the warehouse should accommodate change and expansion without "over-designing."

b. At aerial port bases, an additional 200' x 200' module should be added for general purpose storage.

c. The training room should allow flexible layout of furnishings.

4. Disabled Access

a. All areas of the supply administration and warehouse should be barrier-free and accessible to the physically disabled in accordance with Americans with Disabilities Act (ADA) and Uniform Federal Accessibility Standards criteria.

b. Floor level changes should be avoided in this facility.

D. Building Systems

1. Structural

a. Select a cost effective framing system based on size, projected load requirements, availability of materials, and local labor. Projected load requirements for the facility include the following:

- Floor slab
- High-bay parts storage system loading
- Bulk storage loading
- High-bay clear spans loading

b. Select and design the structural system based on analysis of projected future needs to accommodate expansion easily and economically; however, do not "over design" the initial construction.

c. Design building structural components to reflect space requirements, economy, and subsystem dimensions (e.g., ceiling grid, masonry units, framing members, etc.).

2. Heating, Ventilating, and Air Conditioning

a. Perform a life-cycle cost analysis of available energy sources.

b. Interior design temperatures and relative humidity levels should conform to Air Force standards.

c. Mechanical air circulation should be provided at public areas with limited or no air conditioning.

d. Night setback controls should be provided for the HVAC system.

e. The mechanical system should introduce outside fresh air at a rate of 20 cubic feet per minute (cfm) with a minimum ventilation rate of 20 cfm per square foot.

f. Design this facility to meet federal energy conservation standards defined in 10 CFR (Code of Federal Regulations), "Energy Conservation Voluntary Performance Standards for New Buildings; Mandatory for Federal Buildings."

g. Provide zone controls (temperature sensors with remote adjustment instead of thermostats) to maintain different environmental conditions in all functional areas. Some areas of the facility may require operation of environmental systems when other areas are closed.

h. Provide mechanical exhausts for the rest rooms.

i. The HVAC system should be designed and constructed for easy maintainability, with all the controls on one panel in the mechanical room.

j. Provide for connection to the base energy monitoring and control system.

3. Plumbing

a. Provide domestic hot and cold water, sanitary and storm drainage, plus propane or natural gas systems, if required.

b. For general use, provide hot and cold water to all rest rooms, sinks, and janitor's closets.

c. Provide shut-off valves at all fixtures.

d. Frost-free hose bibs should be provided on all exterior walls if local climate conditions justify them.

4. Electrical

a. Provide electric service, including distribution equipment, wiring, receptacles and grounding, interior and exterior lighting and controls, emergency lighting, telephone, and fire alarms.

b. Provide a back-up generator for 24-hour operation.

c. Evaluate and include the power needs requirements of special equipment such as:

- Battery chargers
- Crane
- Hazardous materials storage fixtures

d. All service equipment should be Underwriters Laboratories listed.

- As an alternative, provide published proof from a bona fide independent testing laboratory.

e. General convenience receptacles and special power outlets should be commercial grade. Convenience receptacles should be a maximum of 12 feet apart. Provide special power outlets and circuits for all computer equipment, as required.

f. General lighting in office areas should be fluorescent with low temperature energy efficient ballasts and lamps. Indirect lighting systems of the high-intensity discharge or fluorescent types may be used where practical.

g. Use of incandescent lighting should be kept to a minimum because of energy efficiency and frequency of maintenance. When used, incandescent lighting should have an extended life of at least 2,500 hours.

h. Lighting control systems should include dimmers to automatically reduce intensity levels of artificial lighting whenever natural light is available.

i. Exterior lighting of parking areas, walkways, and building entrances should be provided. Use high-intensity discharge light sources.

j. Provide illuminated exit signs, public address systems, and battery powered emergency lighting.

k. Provide surveillance systems with at least two levels of detection in designated areas, such as the following:

- Photo card key access
- Voice recognition system
- Provide engine warning receptacles when needed in severe cold climates

5. Fire Protection

a. Facilities should be of noncombustible construction.

b. Hazardous or combustible supplies must be contained within a fire-rated enclosure.

6. Communications

a. The base communications squadron, in coordination with the system telecommunications engineering manager, can provide details on communications requirements and design for the buildings' internal and external phone and data connectivity, as well as alarm system wiring.

b. These requirements should be incorporated in building design specifications, including connectivity to base phone and data infrastructure systems sufficient to support the maximum planned number of building occupants. The requirements are as follows:

- Phone Connections - Provide sufficient preinstalled connections to support the maximum planned number of people in each room. Future growth, modem connections, and special requirements (pay phones, etc.) should be taken into consideration.
- Administrative Data Connections (Local Area Network - LANs) - Provide administrative computer and LAN printer connectivity. Specialized computer connectivity should also be provided to support the base mission when required.
- Optic Connectivity - May be required (internally to several locations and/or externally to system nodes) to support AMC command, control, communications, and computer systems.
- Hands-Free, Two-Way Intercom (Public Address System) - Provide throughout the facility with wall-mounted speaker units.

7. Material Handling

a. The Material Handling Engineering Branch at Wright-Patterson AFB, OH, (DSN: 787-3078) is the focal point for designing and funding materials handling systems. The following material handling guidance includes recommendations which may be altered after further study at base level.

b. Most parts should be stored in a high-bay system with a maximum storage height of 24 feet. Storage should be a combination of:

- Bins - Stored on adjustable shelving initially set at 6 inches apart.
- Open Shelf Storage - Wire rack over framework, 24 inches high and/or 30 inches deep, with adjustable heights for maximum use.
- Pallet Racks - Designed for standard Air Force pallets, 40 inches deep by 48 inches wide, with possible load overhang up to 4 inches total in either direction, 3,000 pound load; vertical spacing is adjustable for maximum use.
- Special Rack - For storage of tire and wheel assemblies. This rack should maintain the tires in an upright, secured position to prevent them from rolling. Because of tire weight and size, they should be stored on the floor or on the first level of the racks.
  - Parts Carousel - For small parts
  - Cantilever Racks - For storing hydraulic tubing, sheet metal and items too bulky for rack storage. The length of the support arms and load capacity must be suitable for the specific items to be stored.

c. In-rack sprinkler systems are required for racks over 12 feet high.

d. Building floors should be level within 0.125 inches in 10 feet, with no more than 0.5 inch deviation in

Vertical spacing of high-density storage racks should be adjustable for maximum use.

Parts are stored and retrieved by man-up turret trucks.

the entire building area used by man-up trucks. Aisle width between rack faces should be 68 inches for turret trucks and 60 inches for order-picking trucks.

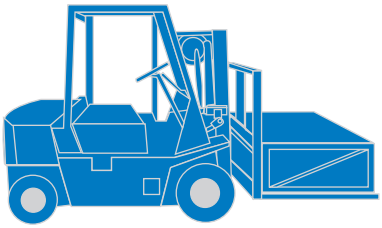
e. Parts stored in a high-bay system are stored and retrieved using man-up turret trucks shown in photo above. Note that storing high-use items at levels below 6 feet will permit manual picking of many items without the trucks.

f. The turret trucks, storage racks, and shelves should be designed for rail guidance. (The floor rail down the aisles and curbs at the ends of shelving, painted yellow in photo above, prevent the truck from coming in contact with the storage racks.) This will require that the lowest level of storage must be even with or above the top of the rail. Racks, shelves, and rail guidance should be designed so that the area under the rack or shelf is either cleanable or sealed to prevent the accumulation of trash or dust.

g. Provide battery charging area for the man-up vehicles. This area should be large enough for four to five vehicles and permit removal of batteries with minimum manual effort. Adequate ventilation should be provided to prevent hydrogen accumulation during charging. Also, provide emergency eyewash and deluge shower.

Chapter 4

Functional Area and Space Criteria



A. General

This chapter presents criteria for designing a supply administration and warehouse facility. Primary design considerations include the use, performance, organization, character, and relationships of component spaces.

For each area, specific criteria are provided concerning space size and critical dimensions. These recommendations may be modified to reflect mission requirements. The sizes of functional areas are specified in Tables 2-B through 2-G, pages 8 through 10.

B. Administrative Functions

1. Design Considerations

a. Use and Performance

See Figures 4-A through 4-G for functional area relationship diagrams and illustrative floor plans.

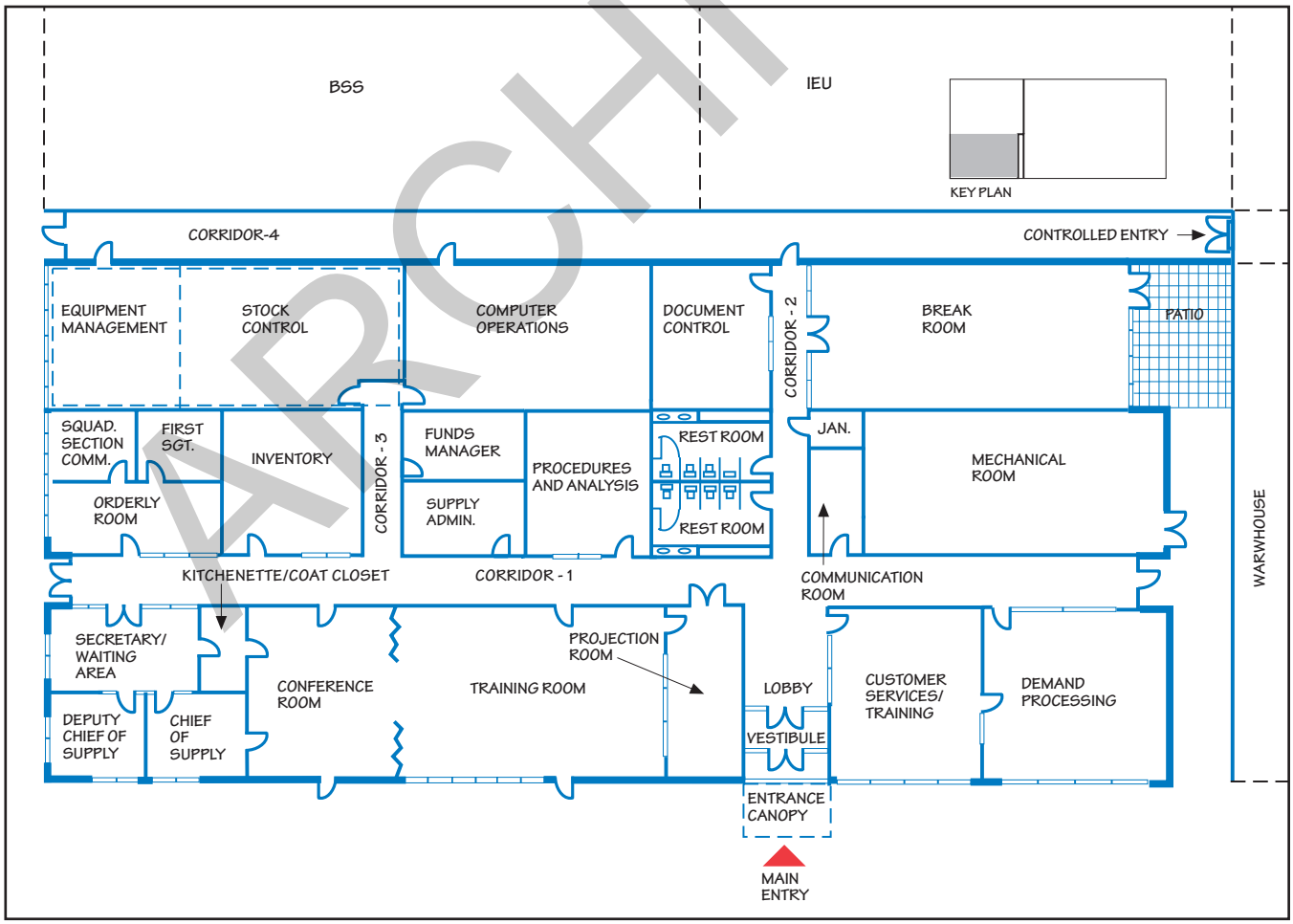


Figure 4-A: Illustrative Floor Plan for the Supply Administration Area.

- The primary administrative areas in Figure 4-A, page 17, include the following:
  - Command activities
  - Central administration
  - Customer services
  - Support spaces

b. Space Organization and Character

- Integrate the entrance into the overall building form. Make it easy to identify and visible from the street, from site parking areas, and to pedestrians.
- Minimize the area dedicated to circulation corridors by allowing users to traverse through one space to get to another.
- Circulation should be designed so that activities are not disrupted by traffic flow.
- Provide natural light and a view of the outdoors unless site conditions, climate, or other circumstances make this undesirable.
- OIC's and NCOIC's offices may be open or enclosed. If open areas, modular systems furnishings should be used.
- Spaces should have a business-like character.
- Command activities should be easily accessible from the main entrance of the facility.
- Customer services is the focal point of the administrative area. It should be located at the main entrance.

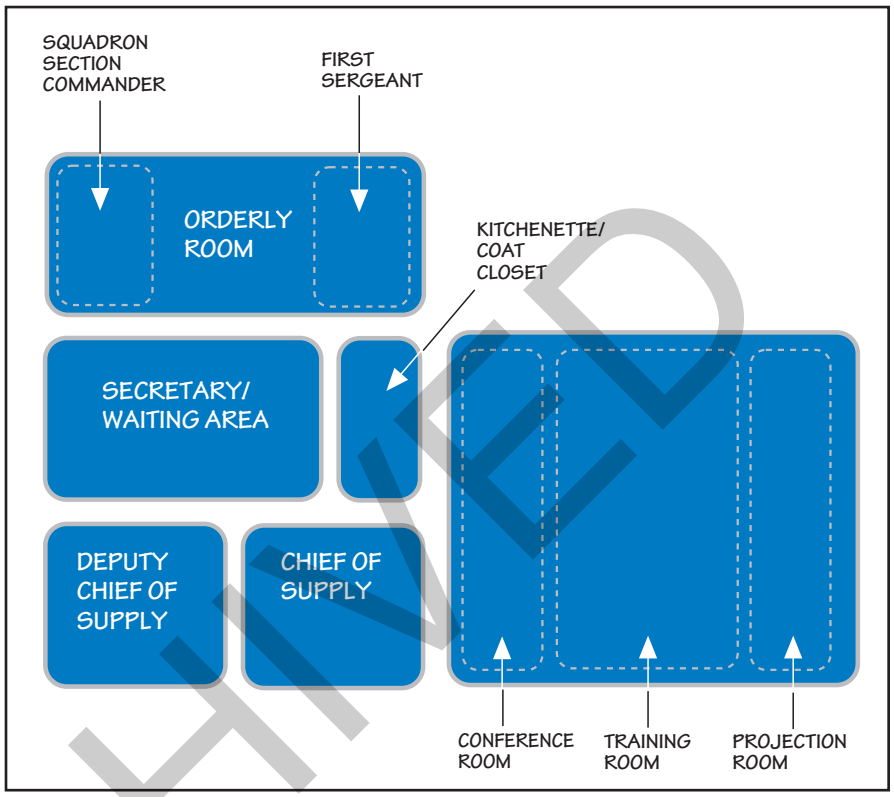


Figure 4-B: Functional Area Relationships for the Command Area.

- The break room area should be easily accessible from the administrative area.
- The training room should be located near the customer service/main entrance to reduce traffic through the facility.

2. Chief of Supply's Office

a. Furnishings and Equipment

- Desk, office chair, credenza, bookcase, and guest chairs

b. Technical Requirements

- Security devices to control public access
- Telecommunications data/computer outlets
- Wiring for LAN computers

3. Deputy Chief of Supply's Office

a. Furnishings and Equipment

- Desk, chair, guest chairs, and bookcase

b. Technical Requirements

- Security devices to control public access
- Telecommunications data/ computer outlets
- Wiring for LAN computers

4. Secretary/Waiting Area

a. Furnishings and Equipment

- Secretary desk and chair
- Lounge chairs for guest waiting
- File cabinets
- Bookcase
- Table
- Photocopier
- Personal computer
- Intercom system

Chief of supply's office should have a business-like character.

Waiting areas should reflect professionalism, warmth, and a strong, positive image.

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers

5. Kitchenette/Coat Closet

a. Furnishings and Equipment

- Base and wall cabinets, coffee maker, microwave oven, bar sink, and under counter refrigerator

b. Technical Requirements

- Locate adjacent to conference room and secretary/waiting area.

6. Conference/Training Room/Projection Room

a. Furnishings and Equipment

- Conference table and chairs
- Marker and tack boards
- Overhead slide projector
- Slide projector
- Video projector, or computerized graphics system
- Rear screen projector
- Personal computers, as required
- Equipment table
- Acoustical-rated movable partition to allow for separation of space. The partition should have a minimum 45 sound transmission class acoustical rating.

Conference/training rooms are used for ongoing educational classes and meetings.

b. Technical Requirements

- In the training room, provide fluorescent lighting and supplement it with incandescent accent lighting.
- Multiple switching and dimming controls for low light levels and energy conservation
- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to control public access

7. Orderly Room

a. Furnishings and Equipment

- Desk, chair, guest chairs, and bookcase in the first sergeant's and squadron section commander's offices
- Base personnel computer
- Modular systems furniture work stations in the orderly room
- Mail distribution boxes
- Lockable cabinets
- Task lighting for work stations
- Five-drawer vertical files

b. Technical Requirements

- Security devices to control public access
- Wiring for LAN computers

8. Funds Management

a. Furnishings and Equipment

- Desks and desk chairs
- Side chairs
- File cabinets
- Shelving units
- Personal computers
- Intercom system

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to control public access

9. Supply Administration

a. Furnishings and Equipment

- Book cases
- Shelving units
- Intercom system
- Modular systems furniture for work stations
- Five-drawer vertical files
- Lockable cabinets should be provided for storage and control of classified documents.

b. Technical Requirements

- Wiring for LAN computers
- Telecommunications data/ computer outlets

10. Inventory

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computer

11. Procedures and Analysis

a. Furnishings and Equipment

- Desks, chairs, guest chairs, and bookcase
- Modular systems furniture for work stations
- Five-drawer vertical files

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers

12. Computer Operations

a. Furnishings and Equipment

- Desk, chair, guest chairs, and bookcase for section manager's office
- Modular systems furniture for work stations
- Personal computers, as required
- An automated data processing equipment unit
- Lockable cabinets for classified materials
- Intercom system

b. Technical Requirements

- Telecommunications data/computer outlets
- Wiring for LAN computers
- Dimmer lighting controls
- Separate environmental control equipment, including air conditioning.
- Security devices to control public access
- Utility systems which include sufficient redundancy to allow for equipment maintenance 24 hours a day
- An uninterrupted power source charger for portable batteries

13. Customer Services/Training

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files
- Cabinets for storage of manuals
- Closed-circuit video camera system to monitor entrance to warehouse

Modular systems furniture offers flexibility for administrative areas.

b. Technical Requirements

- Telecommunications data/computer outlets
- Security devices to control public access
- Wiring for LAN computers
- Location adjacent to main entrance

14. Document Control

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files
- Optical disc system

b. Technical Requirements

- Telecommunications data/computer outlet
- Security devices to control public access
- Wiring for LAN computers

15. Demand Processing

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files

b. Technical Requirements

- Security devices to control public access
- Telecommunications data/computer outlets
- Wiring for LAN computers

16. Stock Control

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files
- Optical disc system

b. Technical Requirements

- Telecommunications data/computer outlets
- Wiring for LAN computers

17. Equipment Management

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files
- Optical disc system

b. Technical Requirements

- Telecommunications data/ computer outlets
- Security devices to control public access
- Wiring for LAN computers

18. OIC's/NCOIC's Offices

a. Furnishings and Equipment

- Desks and desk chairs
- Side chairs
- File cabinets
- Personal computers

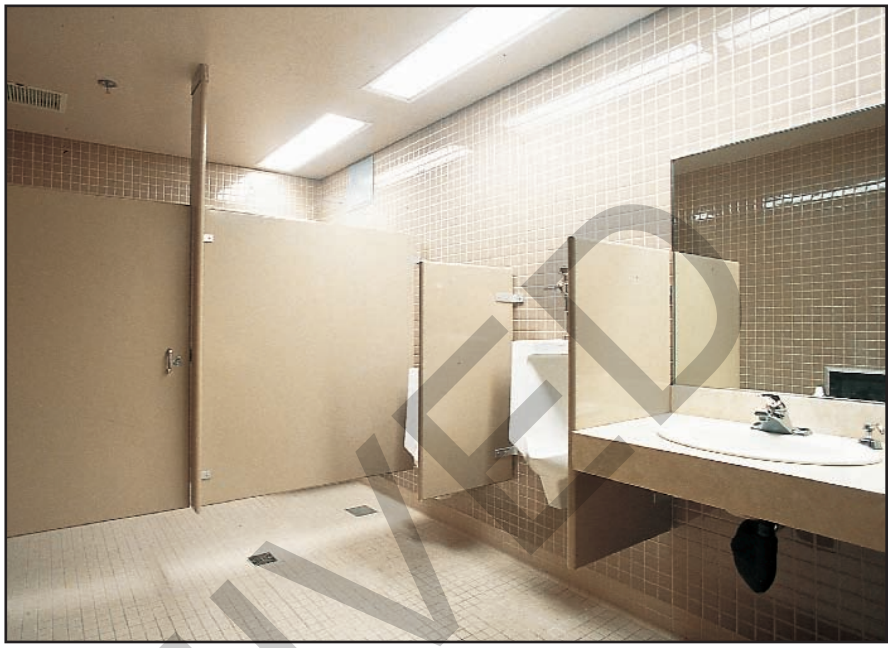
b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to control public access

19. Vestibule/Lobby

a. Furnishings and Equipment

- Public telephone(s)
- Bulletin/announcement boards
- Chairs (at entrance, optional)
- Drinking fountain(s)
- Entrance mats
- Furniture for lobby area
- Built-in, lighted trophy display case, with lockable glass doors



Rest rooms should be attractively designed using materials that provide maximum durability.

b. Technical Requirements

- Easily cleaned, water- and mud-resistant floor materials at all entrances

20. Rest Rooms

a. Furnishings and Equipment

- Men: Water closets, lavatories, urinals, soap dispensers, paper towel dispenser and disposal units, toilet paper holders, grab bars, mirrors, coat hooks, and partitions
- Women: Same as men, minus urinals, plus sanitary napkin dispenser and disposal units

b. Technical Requirements

- Sound transmission class rating: 45 between adjacent rooms
- Finish floors with non-skid ceramic tile
- Finish walls with ceramic tile installed either full height or as a wainscot.
- Use plastic laminate for lavatory counters.

21. Break Room

a. Furnishings and Equipment

- Base and wall cabinets, and a bar sink
- Microwave oven, coffee maker, hot plates, and undercounter refrigerator
- Patio furniture outside
- Durable, good quality dining tables and chairs inside

b. Technical Requirements

- Vending area alcove for soda, snack, and coffee machines

- Install "store front" glass system at the patio
- Walls with minimum sound transmission class rating of 45
- Easily cleaned, water- and mud-resistant flooring materials

22. Janitor's Closet

a. Furnishings and Equipment

- Floor-mounted mop sink
- Shelves and hooks for cleaning and building maintenance equipment

23. Mechanical Room

a. Size and Critical Dimensions

- See Table 2-C, page 8, for recommended space.

b. Furnishings and Equipment

- Floor-mounted mop sink
- Electric panels
- Fire-suppression system controls

c. Technical Requirements

- Sound transmission class rating: 47-52
- Lockable door, entered from the outside of the building

24. Communications Room

a. Size and Critical Dimensions

- See Table 2-C, page 8, for recommended space.

b. Furnishings and Equipment

- Provide for various personal computers, as required.
- Provide surge protection for all computer equipment.

C. Warehouse Functions- General Purpose Storage

1. Design Considerations

a. Use and Performance

See Figure 4-D for receiving/pickup and delivery, and Figure 4-E for storage and issue.

The primary areas of general purpose storage include the following:

- Receiving - Receive incoming shipments and turn-ins.
- Inspection - Occupies the same physical area as receiving; responsible for determining the condition, security classification, and identification of items received, stored, issued, shipped, and transferred.
- Pickup and Delivery - Deliver all supplies and equipment to on-base activities except for retail sales items and routine bench stock issues.
- Packing and Crating - Responsible for crating and uncrating of items to be shipped or stored. Also receives all deliveries and outbound freight.
- Storage and Issue - Storage area for in-warehouse supply and equipment items (except retail sales and mobility). This includes an outside covered storage space. Issue section is responsible for the selection of items to be issued, shipped, or transferred.
- Rest Rooms - For public use; area must be accessible by the disabled.
- Break Room - An area for base supply personnel to take a break, relax, and enjoy a snack in a relaxing environment. An outdoor patio may be included for outside activities.
- Janitor's Closet - Area for mop sinks and storage of maintenance supplies.

b. Space Organization and Character

- Provide in-warehouse administrative office space, break room, and rest rooms.
- Provide a maintenance and battery charging area for material handling equipment. Arrange the area so that the required exits are remote from each other but within 200 feet or less of any point within the facility.
- Ensure that traffic aisles, storage shelving aisles, and equipment can accommodate the material handling equipment.

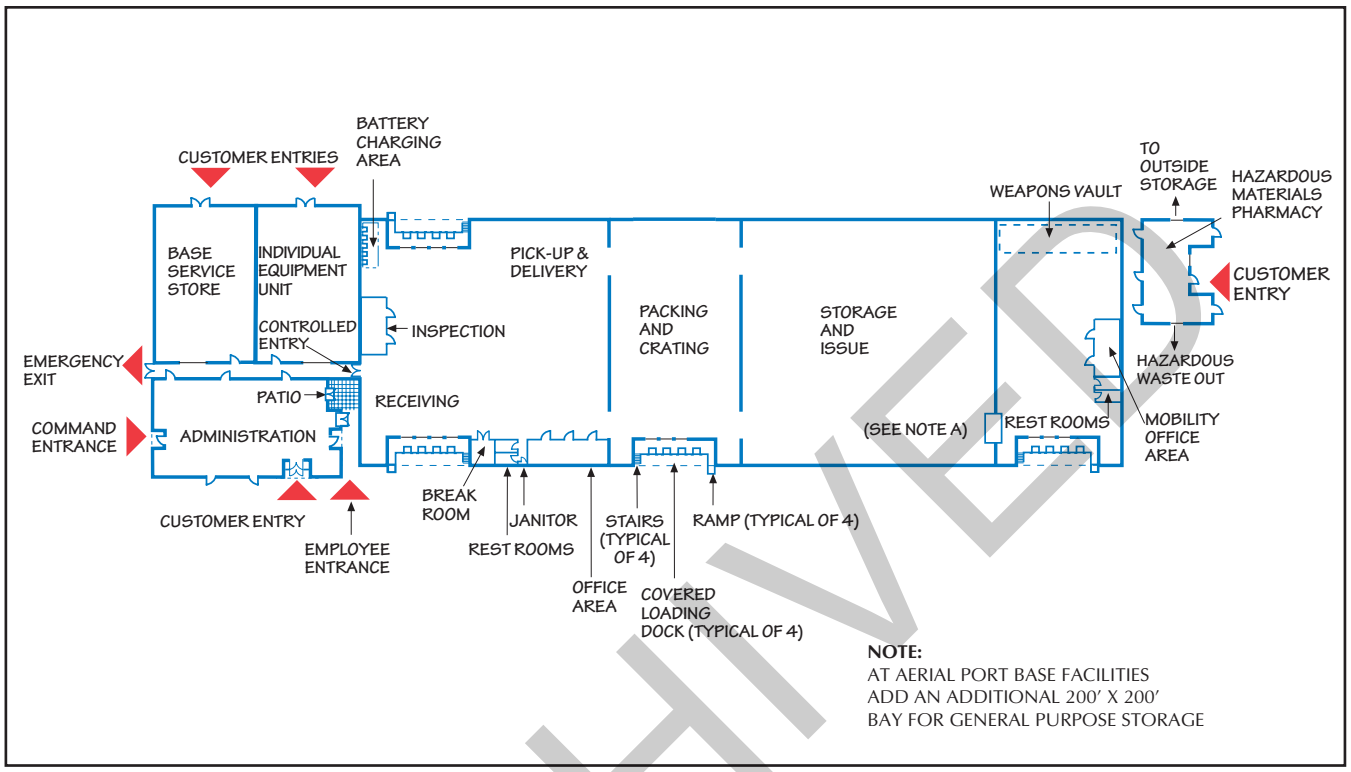


Figure 4-C: Illustrative Floor Plan for the Supply Administration and Warehouse Facilities.

2. Receiving

a. Furnishings and Equipment

- Modular systems furniture for administrative offices
- Desks, desk chairs, guest chairs, and bookcases for OIC's/NCOIC's offices
- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling," for a discussion concerning storage racks and equipment descriptions.
- Overhead rolling doors (at dock openings)
- Ramps for forklift traffic at loading docks
- Level floor in warehouse
- Refrigerated storage (preferably a walk-in) for film and composite materials
- Dock levelers to correct the elevation differences between the loading dock and truck bed. Also provide truck restraints to keep the trailer from pulling away from the dock, and dock door seals for weather protection
- Security system with card key access at entrance between the administration area and the warehouse
- PA system integrated into the telephone system

b. Technical Requirements

- Surveillance system at all entrances
- Separate environmental control equipment, including air conditioning, for the warehouse and office areas
- Telecommunications data/computer outlets
- Wiring for LAN computers
- Secure storage area for classified items. Approximately 1,000 square feet should be allotted for this space.

3. Inspection

a. Furnishings and Equipment

- Modular systems furniture for administrative offices
- Desks, desk chairs, guest chairs, and bookcases for OIC's/NCOIC's offices
- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling," for a discussion concerning storage racks and equipment descriptions.

b. Technical Requirements

- Separate environmental control equipment, including air conditioning, for the warehouse and office areas.
- Telecommunications data/ computer outlets

4. Pickup and Delivery

a. Furnishings and Equipment

- Modular systems furniture for administrative offices
- Desks, desk chairs, guest chairs, and bookcases for OIC's/NCOIC's offices
- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling," for a discussion concerning storage racks and equipment descriptions.
- Dock levelers to correct the elevation differences between the loading dock and truck bed. Also provide truck restraints to keep the trailer from pulling away from the dock, and dock door seals for weather protection.

b. Technical Requirements

- Overhead rolling doors at dock openings
- Ramps for forklift traffic at loading docks
- Telecommunications data/ computer outlets

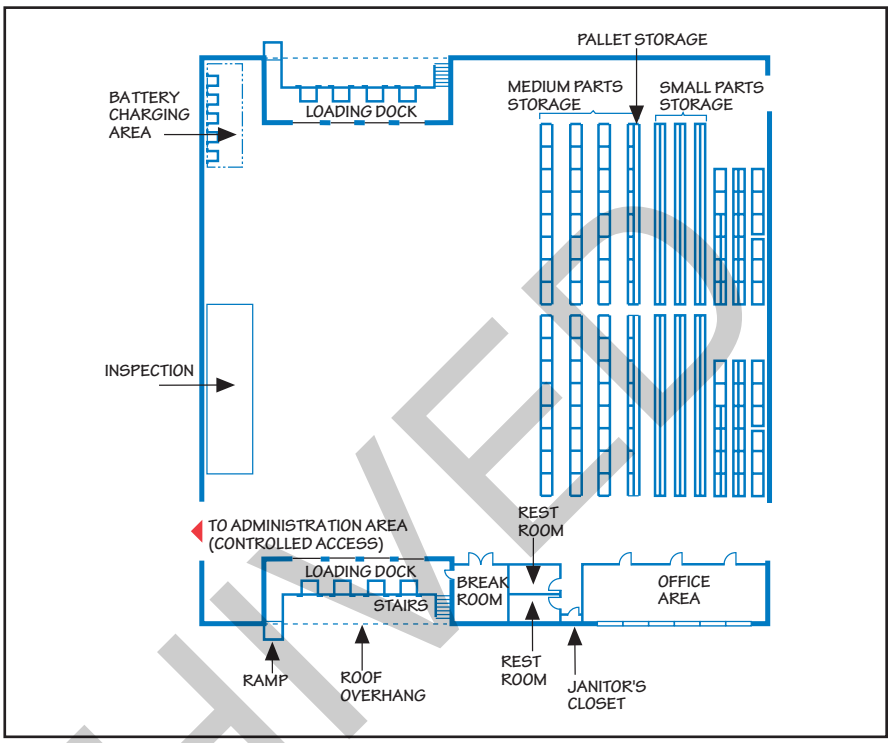


Figure 4-D: Illustrative Floor Plan for Receiving/Pick-Up and Delivery.

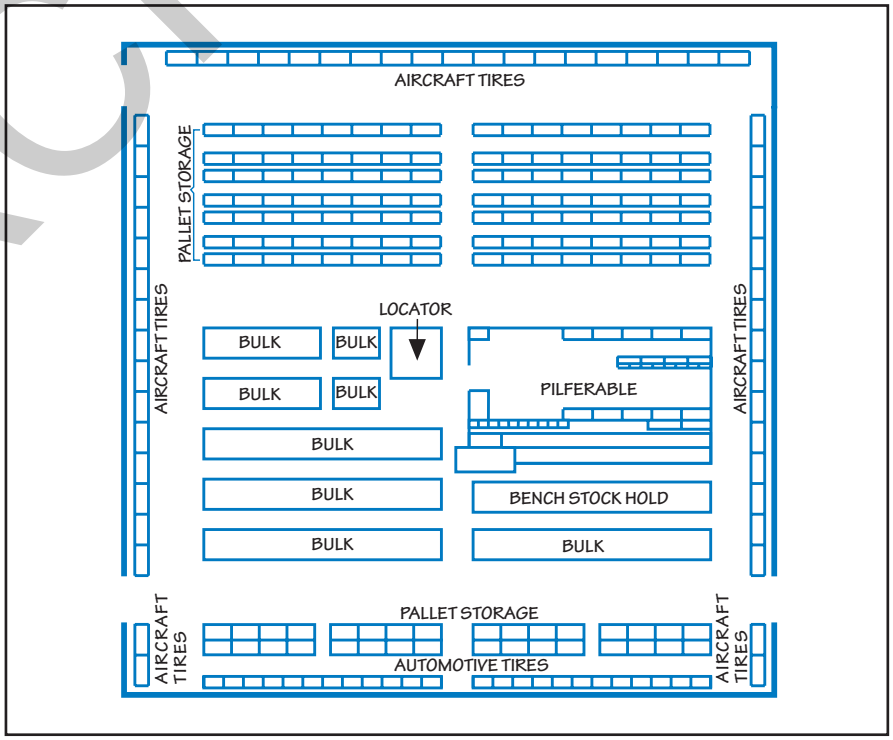


Figure 4-E: Illustrative Floor Plan for Storage and Issue.

5. Packing and Crating

a. Furnishings and Equipment

- Dock levelers to correct the elevation differences between the loading dock and truck bed. Also provide truck restraints to keep the trailer from pulling away from the dock, and dock door seals for weather protection.
- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling" for a discussion concerning storage racks and equipment descriptions.
- Workshop tools for constructing wood crates
- Desks, desk chairs, guest chairs, and bookcases for OIC's/NCOIC's offices
- Overhead rolling doors at dock openings
- Central vacuum system for wood shaving and dust

b. Technical Requirements

- Ramps for forklift traffic at loading docks
- Telecommunications data/computer outlets
- Convenience outlets throughout the area for power hand tools

6. Storage and Issue

a. Furnishings and Equipment

- Modular systems furniture for administrative offices
- Desks, desk chairs, guest chairs, and bookcases for OIC's/NCOIC's offices
- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling," for a discussion concerning storage racks and equipment descriptions.

b. Technical Requirements

- Telecommunications data/computer outlets
- Wiring for LAN computers
- Secure storage area for classified items. Approximately 1,000 square feet should be allotted for this space.

7. Break Room

a. Furnishings and Equipment

- Vending area alcove for soda, snack, and coffee machines
- Base and wall cabinets, and a bar sink
- Microwave oven, coffee maker, hot plates, and undercounter refrigerator
- Durable, good quality dining tables and chairs

b. Technical Requirements

- Wall with minimum sound transmission class rating of 45
- Easily cleaned, water- and mud-resistant flooring materials

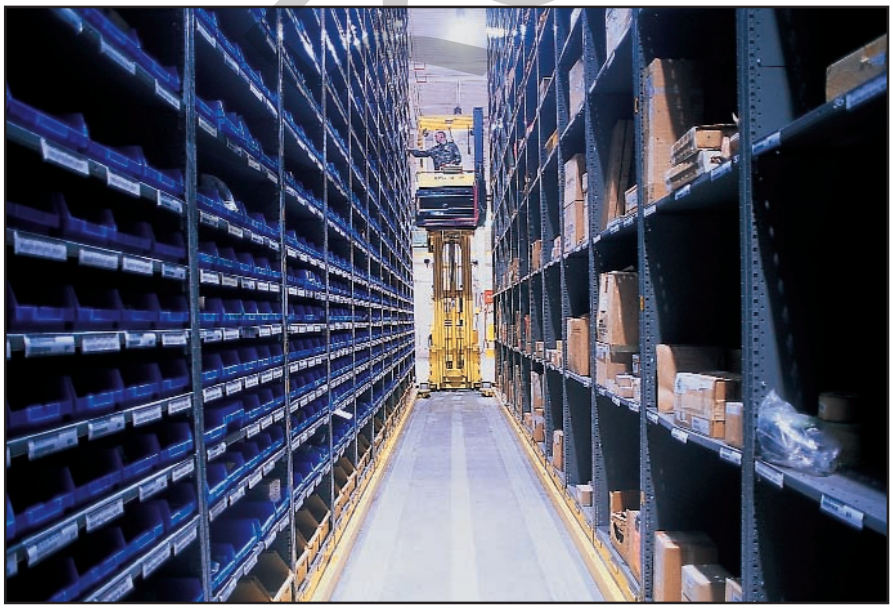
8. Rest Rooms

a. Furnishings and Equipment

- Men: Water closets, lavatories, urinals, soap dispensers, paper towel dispenser and disposal units, toilet paper holders, grab bars, mirrors, coat hooks, and partitions
- Women: Same as men, minus urinals, plus sanitary napkin dispenser and disposal units

b. Technical Requirements

- Sound transmission class rating: 45 between adjacent rooms



Aisle widths between storage rack faces should be adequate to support order-picking trucks.

9. Janitor's Closet

a. Furnishings and Equipment

- Floor-mounted mop sink
- Shelves and hooks for cleaning and maintenance equipment

b. Technical Requirements

- Water-resistant, easily maintained floor material, sloped to a floor drain.

10. OIC's/NCOIC's Offices

a. Furnishings and Equipment

- Desks and desk chairs
- Side chairs
- File cabinets
- Personal computers

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to prevent public access

D. Warehouse Functions- Retail Sales

1. Design Considerations

a. Use and Performance

- Retail sales is responsible for direct sales or issue of individual equipment, tools, and expendable supplies to satisfy customer requirements.
- The BSS (Base Service Store) and IEU (Individual Equipment Unit) are part of the retail sales section.
- BSS - Storage and issue of items such as the BSS. These items include hand tools, warranted tools, and office/administrative supplies.
- IEU - Centralized on-base issue, storage, and turn-in points for all items authorized for people with the proper Air Force Specialty Code or duty.
- OIC's/NCOIC's Offices - Individual offices for officers and NCOs in charge of various BSS and IEU functions
- Dressing Rooms - Three individual spaces that provide privacy for fitting of clothing items
- Administrative Office - The primary area for record keeping, billing, operational, and administrative needs

b. Space Organization and Character

- BSS and IEU should be located adjacent to each other.
- Locate the BSS and IEU in close proximity to the administration area.
- BSS and IEU should be accessible to the public.
- BSS and IEU spaces should have a business-like character.

2. Base Service Store

a. Furnishings and Equipment

- Vertical carousel for small item storage
- Counter 42 inches high with drawers
- Desks, desk chairs, guest chairs, and bookcases in office area
- Display shelving and racks
- Pallet-rack and wide-span shelving for backup stock

The base service store should have a business-like character.

b. Technical Requirements

- Outside access
- Secure storage area
- Telecommunications data/ computer outlets

3. Individual Equipment Unit

a. Furnishings and Equipment

- Space-saver bins for clothing storage
- Counter 42 inches high with drawers

The display areas for the individual equipment unit should convey a pleasant shopping atmosphere.

Customer service counter for individual equipment unit should have professional appearance.

- Desks, desk chairs, guest chairs, and bookcases in office area
- Clothing display racks and shelving
- Pallet-rack and wide-span shelving for back-up stock
- Specialized lighting, such as track lights and recessed spot lights to enhance sales areas

b. Technical Requirements

- Outside access
- Secure storage area
- Telecommunications data/ computer outlets

4. OIC's/NCOIC's Offices

a. Furnishings and Equipment

- Desks and desk chairs
- Side chairs
- Five-drawer file cabinets vertical files
- Personal computers

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to prevent public access

5. Dressing Rooms

a. Furnishings and Equipment

- Clothes hooks
- Chairs
- Full length mirrors
- Lockable doors

6. Administrative Office

a. Furnishings and Equipment

- Modular systems furniture for work stations

- Five-drawer vertical files
- Lockable cabinets should be provided for manual storage.

b. Technical Requirements

- Wiring for LAN computers
- Telephone/computer outlets

E. Warehouse Functions-Mobility

1. Design Considerations

a. Use and Performance

- Responsible for all functions involved in the management of mobility bags and small arms. The primary areas of mobility are:
  - Mobility Bag Storage - Store and issue mobility kit baggage (individual equipment items).
  - Weapons Vault - Store, issue, ship, or transfer weapons (including mobility and base defense weapons).
  - OIC's/NCOIC's Offices - Individual offices for officers and NCOs in charge of various mobility functions.
  - Administration Office - The primary area for record keeping, billing, operational, and administrative needs.
  - Rest Rooms - For mobility section personnel.

b. Space Organization and Character

- Mobility should be located away from other supply functions so that when mobilization occurs, mobility activities are not disruptive to other supply activities.
- The weapons vault utilizes approximately 2,400 square feet.

2. Mobility Bag Storage

a. Furnishings and Equipment

- Refer to Chapter 3, page 15, paragraph D-7, "Material Handling," for a discussion concerning storage racks and equipment descriptions.
- Provide dock levelers for elevation correction between the loading dock and truck bed, truck restraints to keep the trailer from pulling away from the dock, and dock door seals for weather protection.
- Overhead rolling doors at dock openings
- Surveillance system at all entrances

b. Technical Requirements

- Loading dock with ramp for forklift traffic
- Separate environmental control equipment, including air conditioning, for the baggage area, the weapons vault, and the office area
- Telecommunications data/computer outlets
- Wiring for LAN computers in office areas

3. Weapons Vault

a. Furnishings and Equipment

- Surveillance camera in weapons vault for monitoring personnel inside

b. Technical Requirements

- Intrusion detection alarm system
- Back-up lighting system
- Security door

4. OIC's/NCOIC's Offices

a. Furnishings and Equipment

- Desks and desk chairs
- Side chairs
- File cabinets
- Personal computers

Provide racks for made-up mobility bag storage.

b. Technical Requirements

- Telecommunications data/ computer outlets
- Wiring for LAN computers
- Security devices to prevent public access

5. Administrative Office

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five-drawer vertical files
- Lockable cabinets

b. Technical Requirements

- Wiring for LAN computers
- Telephone/computer outlet

6. Rest Rooms

a. Furnishings and Equipment

- Men: Water closets, lavatories, urinals, soap dispensers, paper towel dispenser and disposal units, toilet paper holders, grab bars, mirrors, coat hooks, and partitions
- Women: Same as men, minus urinals, plus sanitary napkin dispenser and disposal units

b. Technical Requirements

- Sound transmission class rating: 45 between adjacent rooms

F. Warehouse Functions- Hazardous Materials Pharmacy

1. Design Considerations

Hazardous materials pharmacy must conform to federal, state, and local laws which vary in different locations.

a. Use and Performance

- This facility is the central point for receipt, issue, and collection of hazardous materials, including empty containers. All pharmacy activities should be centralized for efficient use of space and manpower.
- Office areas should have adequate lighting, be temperature-controlled, and provide for coordinated interface between management and staff.
- A short-term accumulation point should be provided where materials will be held for less than 90 days.
- Separation of hazardous materials and flammable storage
- Environmental controls
- Lighting
- Floor surfaces
- Security and surveillance of pharmacy
- Fire protection based on type of materials stored
- Material handling equipment
- Work area for measuring, packaging, and labeling materials

b. Space Organization and Character

- Facility should be of noncombustible construction.
- All areas holding hazardous waste must be in the same physical area.
- The receiving area should be easily accessible for outside approach by pharmacy customers.
- Traffic aisles and aisles between storage shelving to accommodate material handling equipment
- Locate customer service and administrative office near main entrance to the facility.

2. Staging and Segregation

a. Furnishings and Equipment

- Overhead rolling door
- Safety equipment/facilities, e.g., eyewash and deluge shower
- Scale (0-500 pound capability)

b. Technical Requirements

- Spill containment pit

3. Hazardous Materials and Flammable Storage

a. Furnishings and Equipment

- 14-foot stacking height shelves
- Safety equipment/facilities, e.g., eyewash and deluge shower

b. Technical Requirements

- Explosion-proof receptacles in flammable storage areas
- Interior ceiling and walls finished with non-combustible materials

- Use explosion-proof heaters
- Containment pits with cover grates
- Ventilation

4. Customer Service

a. Furnishings and Equipment

- Customer service counter
- Modular systems furniture for work stations
- Five-drawer vertical files
- Telecommunications data/ computer outlets
- Closed-circuit video camera to monitor customer entrance
- Automated data processing equipment (bar coder)

b. Technical Requirements

- Security devices to prevent public access
- Wiring for LAN computers

5. Manager's Office

a. Furnishings and Equipment

- Desk, chair, guest chair, and bookcase

b. Technical Requirements

- Security device to prevent public access
- Telecommunications data/ computer outlets
- Wiring for LAN computers

6. Administrative Office

a. Furnishings and Equipment

- Modular systems furniture for work stations
- Five drawer vertical files

b. Technical Requirements

- Security device to prevent public access
- Wiring for LAN computers
- Telecommunications data/ computer outlet

7. Reutilization Area

a. Furnishings and Equipment

- Shelving
- Explosion-proof refrigerator

b. Technical Requirements

- Ventilation
- Spill containment pits with grating
- Safety equipment and facilities, e.g., eyewash and deluge shower

8. Hazardous Waste Accumulation Point

a. Furnishings and Equipment

- 14-foot stacking height shelves

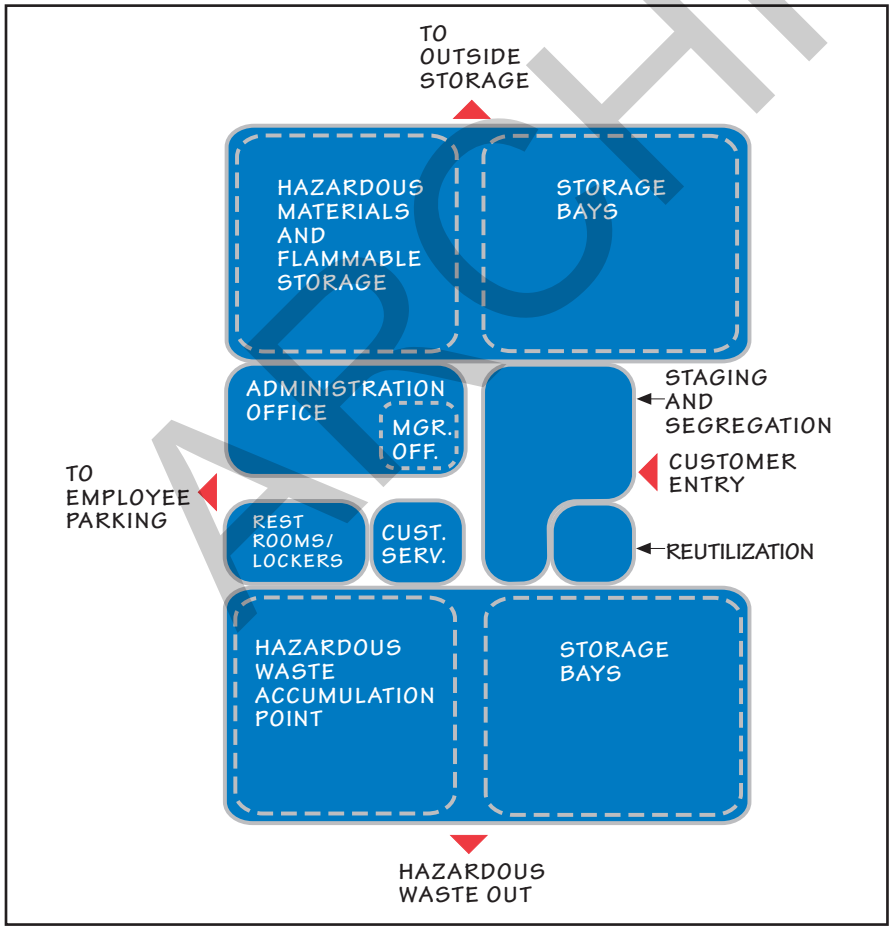


Figure 4-F: Functional Area Relationships for the Hazardous Materials Pharmacy.

- Safety equipment and facilities, e.g., eyewash and deluge shower

b. Technical Requirements

- Explosion-proof receptacles in flammable storage areas
- Use explosion-proof heaters.
- Containment pits with cover grates
- Ventilation

9. Rest Rooms/Lockers

a. Furnishings and Equipment

- Lockers
- Men: Water closets, lavatories, urinals, soap dispensers, paper towel dispenser and disposal units, toilet paper holders, grab bars, mirrors, coat hooks, and partitions
- Women: Same as men, minus urinals, plus sanitary napkin dispenser and disposal units

b. Technical Requirements

- Sound transmission class rating: 45 between adjacent rooms
- Finish floors with non-skid surface
- Provide floor drain

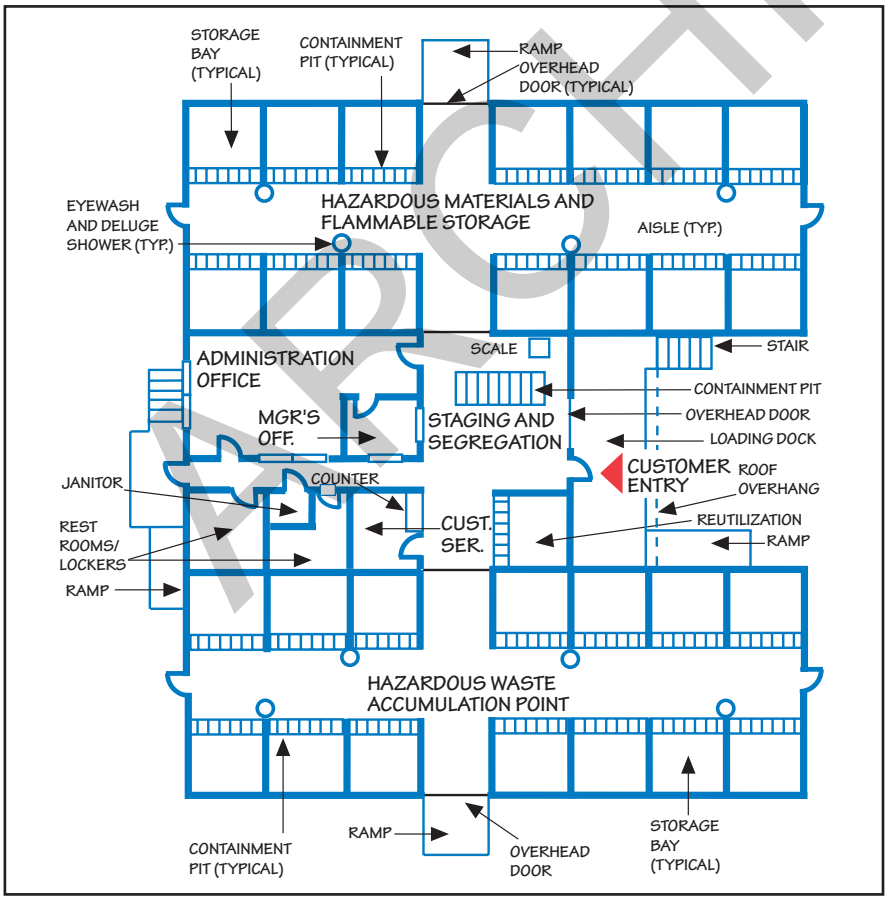


Figure 4-G: Illustrative Floor Plan for the Hazardous Materials Pharmacy.

G. Warehouse Functions- Outside Storage

1. Design Considerations

a. Use and Performance

- This large space is for storage of bulk items and equipment that can be stored outdoors, thus freeing space within the warehouse

b. Space organization and Character

- The open storage and covered storage may be collocated.
- Provide covered shelter without complete side walls and end walls.

2. Open Storage

a. Furnishings and Equipment

- Security fencing
- Controlled-access gate

b. Technical Requirements

- Paved surfaces
- Exterior lighting for night time visibility and surveillance.

3. Covered Storage

a. Furnishings and Equipment

- Cantilever racks for tubing and lumber

b. Technical Requirements

- Paved surfaces
- Exterior lighting ■

Chapter 5

Interior Finishes

A. General

Finish materials and furnishings should be selected using professional interior design services. Selections should be based on anticipated use, maintenance requirements, life-cycle cost, fire and other life safety requirements, as well as aesthetic qualities.

Coordinate materials, finishes, colors, and texture selections to complement the overall building design and image. Select colors and finishes to express professionalism, warmth, and a strong, positive image.

B. Finish Schedule

Use colors and finishes to highlight and differentiate spaces designed to accommodate different types and levels of activity. For example, the maintenance area requires extremely durable and easy to maintain finishes.

Color schemes should be predominantly neutral. The designer should consider the seasonal temperature range of the base when selecting a color scheme, such as cool colors (blue, green) in hot climates and warm colors (beige, tan) in cold climates.

Choose furniture that is durable, comfortable, modular, and flexible. (Scott AFB, IL)

Floor finishes in the warehouse should be a durable, highly reflective, non-slip urethane surface of a neutral color. Aisles between storage bins and racks should have color differential from main floor surfaces. Exposed ceiling structures within the warehouse should be painted with a color that is highly reflective.

Permanent and semi-permanent surface materials, such as tile, carpet, and the majority of the wallcoverings, should be in neutral colors such as beige, taupe, or gray tones.

Patterned carpet (bold tweeds) can be the basis for the overall color scheme, as well as mask traffic wear.

Paint mechanical and electrical devices to match the background surface. Room finish schedules are listed in Tables 5-A through 5-G.

C. Furniture

Furniture is an integral part of the overall building design and image. Coordinate furniture selection for consistency with finish materials, textures, and colors of built-in elements.

Choose furniture that is durable, comfortable, modular, and flexible. Systems furniture, which may be funded as part of a military construction project, is recommended for all administrative areas. ■

List of Abbreviations

ACT	Acoustical Ceiling Tile	P	Paint
CONC-S	Concrete, Sealed	PL	Plastic Laminate.
CONC-P	Concrete, Painte	QT	Quarry Tile
CPT	Carpet	VB	Vinyl Base
CT	Ceramic Tile	VCT	Vinyl Composition Tile
EXP-P	Exposed Structure, Painted	VWC	Vinyl Wallcovering
NA	Not Applicable		

Finish Schedule—Supply Administration & Warehouse Facilities-Command Areas

Functional Area Name	Floors	Base	Walls	Ceiling
Chief of Supply	CPT	VB	VWC	ACT
Deputy Chief of Supply	CPT	VB	VWC	ACT
Squadron Section Commander	CPT	VB	VWC	ACT
First Sergeant	CPT	VB	VWC	ACT
Secretary/Waiting Area	CPT	VB	VWC	ACT
Kitchenette/Coat Closet	QT	QT	VWC	ACT
Conference/Training Rooms	CPT	VB	VWC	ACT
Orderly Room	CPT	VB	VWC	ACT

Table 5-A: Finish Schedule for the Command Areas.

Finish Schedule—Supply Administration & Warehouse Facilities-Central Administration Areas

Functional Area Name	Floors	Base	Walls	Ceiling
Funds Management	CPT	VB	VWC	ACT
Supply Administration	CPT	VB	VWC	ACT
Inventory	CPT	VB	VWC	ACT
Procedures and Analysis	CPT	VB	VWC	ACT
Computer Operations	CPT	VB	VWC	ACT
Customer Services/Training	CPT	VB	VWC	ACT
Document Control	CPT	VB	VWC	ACT
Demand Processing	CPT	VB	VWC	ACT
Stock Control	CPT	VB	VWC	ACT
Equipment Management	CPT	VB	VWC	ACT

Table 5-B: Finish Schedule for the Central Administration Areas.

Finish Schedule—Supply Administration & Warehouse Facilities-Common Use Areas

Functional Area Name	Floors	Base	Walls	Ceiling	Laminate
Vestibule/Lobby	QT	QT	VWC	ACT	NA
Circulation Corridors(1)	CPT/VCT	VB	VWC	ACT	NA
Men's Rest Room	CT	CT	VWC/CT	P	PL
Women's Rest Room	CT	CT	VWC/CT	P	PL
Break Room	VCT	VB	P	ACT	NA
Janitor's Closet	CONC-S	VB	P	P	NA
Mechanical Room	CONC-S	NA	P	EXP	NA
Communications Room	CONC-S	VB	P	EXP	NA

Table 5-C: Finish Schedule for the Common Use Areas.

Legend for Table 5-C.

(1) If entry into these spaces is directly from the warehouse or an outside area use VCT, otherwise use:

- Corridor #1 = CPT
- Corridor #2 = VCT
- Corridor #3 = CPT
- Corridor #4 = VCT

Legend for all applicable tables.

CONC-P for floors is a polyurethane coating for better house-cleaning, energy conservation, light reflection, and aesthetics. Color should be a light gray. Other colors may be used to highlight specific areas such as hazardous storage.

Finish Schedule—Supply Administration & Warehouse Facilities-General Purpose Storage Areas

Functional Area Name	Floors	Base	Walls[1]	Ceiling
Battery Charging Area	CONC-P	NA	P	EXP-P
Receiving	CONC-P	NA	P	EXP-P
Inspection	CONC-P	NA	P	EXP-P
Pickup and Delivery	CONC-P	NA	P	EXP-P
Packing and Crating	CONC-P	NA	P	EXP-P
Storage and Issue	CONC-P	NA	P	EXP-P
Office Areas	VCT	VB	VWC	ACT

Table 5-D: Finish Schedule for the General Purpose Storage Areas.

Legend for Table 5-D.
(1) All walls should be of a durable nature, such as: concrete block, concrete, steel siding panels, etc.

Finish Schedule—Supply Administration & Warehouse Facilities-Retail Sales Areas

Functional Area Name	Floors	Base	Walls	Ceiling
Base Service Store Areas				
OIC's/NCOIC's Offices	CPT/VCT[1]	VB	VWC	ACT
Administration Office	CPT/VCT[1]	VB	VWC	ACT
Display Area	VCT	VB	VWC	ACT
Storage Area	CONC-P	VB	P	ACT
Individual Equipment Unit Areas				
OIC's/NCOIC's Offices	CPT/VCT[1]	VB	VWC	ACT
Administration Office	CPT/VCT[1]	VB	VWC	ACT
Dressing Rooms	VCT	VB	P	ACT
Display Area	CPT/VCT	VB	VWC	ACT
Storage Area	CONC-P	VB	P	ACT

Table 5-E: Finish Schedule for the Retail Sales Areas.

Legend for Table 5-E.
(1) If entry into these spaces is directly from the warehouse or an outside area, use VCT.

Finish Schedule—Supply Administration & Warehouse Facilities-Mobility Areas

Functional Area Name	Floors	Base	Walls	Ceiling	Laminate
Mobility Bag Storage	CONC-P	NA	P	EXP-P	NA
Weapons Vault	CONC-P	NA	P	EXP-P	NA
OIC's/NCOIC's Offices	VCT	VB	P	ACT	NA
Administration Office	VCT	VB	P	ACT	NA
Men's Rest Room	CT	CT	VWC/CT	P	PL
Women's Rest Room	CT	CT	VWC/CT	P	PL

Table 5-F: Finish Schedule for the Mobility Areas.

Finish Schedule—Supply Administration & Warehouse Facilities-Hazardous Materials Pharmacy Areas

Functional Area Name	Floors	Base	Walls	Ceiling	Laminate
Staging and Segregation(1)	CONC-S	NA	P	EXP-P	NA
Hazardous Materials and(1) Flammable Storage	CONC-S	NA	P	EXP-P	NA
Customer Service	CONC-S	NA	P	EXP-P	NA
Manager's Office	VCT	VB	P	ACT	NA
Administrative Office	VCT	VB	P	ACT	NA
Reutilization(1)	CONC-S	VB	P	EXP-P	NA
Hazardous Waste Accumulation Point(1)	CONC-S	NA	P	EXP-P	NA
Men's Rest Room	CT	CT	VWC/CT	P	PL
Women's Rest Room	CT	CT	VWC/CT	P	PL

Table 5-G: Finish Schedule for the Hazardous Materials Pharmacy Areas.

Legend for Table 5-G.

(1) Non-combustible materials

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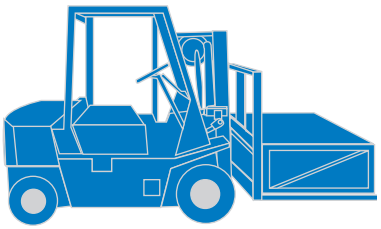

AFM 67-1 Vol. II, Part I	Mechanized Material Handling Systems and Storage Aids Systems
AFI 32-1024	Standard Facility Requirements
AFM 88-3	Structural Design Criteria Loads
AFI 32-1023	Design and Construction Standards and Execution of Facility Construction Projects
AFI 31-209	The Air Force Resource Protection Program
ADA	Americans with Disabilities Act
DoD 4145.21M1	Material Handling/Storage
DoD 4270.1-M	Construction Criteria Manual
FED STD. 795	Uniform Federal Accessibility Standards
MIL-HDBK 1008B	Military Handbook for Fire Facilities Engineering, Design, and Construction
MIL-HDBK 1005/13	Military Handbook for Governing Hazardous Material Storage.
MIL-HDBK 1032/2	Military Handbook for Governing Hazardous Waste Storage
MIL-HDBK 1190	Military Building Code
NFPA-43D, 43D, 49, and 490	National Fire Protection Association Codes Governing Hazardous Materials Storage
NFPA-70	National Electric Code
NFPA-231 and 231C	Sprinkler Protection for Flammable Liquid Storage
NFPA 101	Life Safety Code 101
NFPA 30: 4-5.6	Flammable and Combustible Liquid Storage for General Purpose Warehouse
10 CFR (Code of Federal Regulations) Chapter 11	"Energy Conservation Voluntary Performance Standards for New Buildings; Mandatory for Federal Buildings."
40 CFR Part II 260-28.1	Standards Applicable to Generators of Hazardous Waste (Resource Conservation and Recovery Act)
AMC	Commander's Guide to Facility Excellence
AMC	Architectural Compatibility Guide
AMC	Hazardous Material Pharmacy Facility Planning and Design Guide (August, 1993)
AMC	Interior Design Guide (April, 1994)

AIR MOBILITY COMMAND...

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