

**DEPARTMENT OF DEFENSE
PERSONAL PROPERTY STORAGE**

**Guidelines For
Warehouse
Construction**

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Department of the Army
Surface Deployment and Distribution Command
200 Stovall Street
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Unclassified

INTRODUCTION

The Surface Deployment Distribution Command's Regional Storage Management Office (RSMO) receives inquiries from current and prospective agents and contractors regarding requirements for SIT/NTS Warehouses.

They have been asked to approve plans and blueprints prior to construction, **which they cannot do.**

Considering the enormous investment necessary to purchase or construct warehouses, it is understandable that agents/contractors want to do as much preplanning as possible. It must also be understood that the RSMO cannot pre-approve buildings. An On-Site inspection must be performed; in addition, the agent/contractor will provide various documents and information to the RSMO. The RSMO's do not perform "ON-SITE APPROVAL".

The purpose of these high standards is to ensure that DoD Personal Property is stored only in facilities that will provide the highest level of protection our service members desire and deserve.

These guidelines for Warehouse construction were developed to assist agents/contractors in the planning, acquisition and construction of facilities to be utilized for NTS/SIT. It must be understood that this publication is not intended to increase, restrict or deviate from any provisions of existing regulations or standards. There are certain absolute requirements that will be discussed. Those will be underlined. Other items discussed are recommendations/options to be considered prior to purchase or construction or lease. Questions concerning the information discussed herein should be directed to the RSMO.

A. SITE LOCATION.

1. LOCATION: The following should be considered. Distance to Military Activity? Distance to Scales? Extent of Police Protection? Surrounding Hazardous Activities? Flood Hazard? Will the elevation of the first floor be above the 100-year flood level? This can be determined by various agencies i.e. City Planners, FEMA, Local Surveyors, or the Corps of Engineers. How is area zoned? Is the servicing Fire Department Rated No Higher than Class 8? What is the public service commission commercial zone?
2. PURCHASE PRICE: Land prices vary considerably depending largely on sit location. Cost of site development should be investigated. A low purchase price may not be a bargain if site preparation will be extensive and costly.

3. SIZE: As a General Guideline a rate of 3 to 1 in land to building is recommended. This allows for a truck yard, off-street parking and 100% building Expansion. Local building codes should be checked for possible violations.

4. ACCESS: Is the Site close to ON/OFF ramps to main highway? Check for overhead obstructions and rail crossings or access streets, which could block trucks. Check for highway weight and height restrictions on trucks.

5. TAXES: Compare taxes to those of alternate sites.

6. UTILITIES: Availability of Electricity, Sewage System and Water Supply should be investigated. Adequate water capacity and residual pressure are important for meeting sprinkler system requirements.

B. BUILDING LAYOUT

1. STORAGE LAYOUT: The warehouse operation and storage system should be planned before any design work is started on a building. Too often the warehouse planner is forced to fit the operation and storage layout into an existing building, resulting in built-in inefficiencies. A storage layout should be developed, detailing aisles, storage blocks, special storage areas, O/S and Rug Racks, etc. Consider leaving enough space between storage and outside walls to allow access for rodent/insect control and firefighting. Have your warehouse layout approved by the local fire department to ensure it meets all codes.

2. BUILDING CONFIGURATION AND SIZE: Once the storage requirements have been determined, the building configuration and size can be approximated. Initial construction should provide building space adequate for at least five years. Building design and placement on site should anticipate possible future expansion. If the warehouse will probably become outgrown in 10-15 years and be put up for sale, the building design should not be so highly specialized as to make it unattractive for others to use.

3. BUILDING PLACEMENT ON SITE. Placement of warehouse on the site should be consider the following:

- a. Locate building to take advantage of natural grade elevation, if possible.
- b. Minimize length of service road to main highway.
- c. Provide adequate room for maneuvering Tractor/Trailers.
- d. If possible DO NOT FACE LOADING DOORS IN WINDARD

- DIRECTION. Dust and rain will blow in when doors are open.
- e. Traffic flow should allow trucks to back to the LEFT into the Dock or/and Loading Doors. This is easier and safer for Drivers.

C. LOADING DOORS; .

1. The optimum number of doors is governed by the daily volume in/out of warehouse.
2. Rubber Bumpers, Door Jams and Post Protectors are recommended.

D. OFFICE:

1. Consideration should be given to locating office near the center of the building to minimize walking distance between office and warehouse floor.
2. Depending on size and configuration of warehouse, it may be advantageous to have a separate shipping and transportation office adjacent to the dock. This area may include truck driver waiting room, lockers, lunch and restrooms for warehouse personnel. A two-story office or mezzanine office will make full use of ceiling heights and may offer cost savings.

E. BUILDING EXPANSION:

1. Provisions for logical expansion should be planned in the development of initial building design, location and layout. Normally a warehouse is expanded by adding bays to each end, which would extend the truck facilities, but not necessitate their relocation. Initial office location should be logical to final building size after expansion. Utilities should have initial capacity to meet requirements after expansion or be capable of expansion.

F. YARD AND CAR PARKING:

1. TRUCK YARD: Should be big enough to permit easy maneuverability of trucks backing up to loading doors.
2. PAVING: Consideration should be given to paving or at least using crushed rock on truck and car areas. Warehouses whose first floors are ground level are particularly susceptible to dust, dirt mud, etc.
3. CAR PARKING: Employee and visitor car parking is best located outside of fenced truck yard for security reasons. Check local building codes for minimum size requirements.

G. DOCK:

1. The following questions should be addressed:
 - a. Should there be a Dock? _____
 - b. What Height(s) should it be? _____
 - c. Should it be Covered? _____
 - d. Should it be protected by a Fire Alarm or Sprinkler System? _____
 - e. Should it have a Ramp? _____
 - f. Are Bumpers necessary? _____
 - g. Should Truck Wells be installed? _____
 - h. Should Warehouse Wall facing Dock have extra protection? _____

H. FLOORS:

Recommend floors be sealed for dust and coated with polyurethane or equivalent for easier housekeeping and good appearances.

I. EXTERIOR WALLS:

1. Although we DO NOT recommend a specific type construction, “FRAME” OR “POLE” BUILDINGS ARE UNACCEPTABLE FOR STORAGE OF DOD PERSONAL PROPERTY DUE MAINLY TO THE EXTREME FIRE HAZARD ASSOCIATED WITH THIS TYPE OF CONTRUCTION..

2. It is suggested that metal, “BUTLER” type buildings in addition to insulation, have block walls up 4-8 feet from floor to protect against damage from forklifts, boxes, etc. and also provide additional security.

J. ROOF:

Special attention should be paid to quality in this area. Leaking roofs are a constant problem. Also load capacity must be considered in regions with heavy snow fall.

K. ENVIRONMENTAL PROTECTION:

1. Currently, buildings with exposed metal walls/ceiling/roof must have these areas insulated or provide a disinterested third party engineer's environmental report certifying that the facility will protect stored household goods from extreme heat, cold, moisture, humidity and other environmental conditions such as mold and mildew.

NOTE: The following are some of the areas that must be addressed in detail by the engineer when providing an environmental report:

a. The effects of temperature and humidity at the height of the topmost storage vaults and upholstered storage racks.

b. The temperatures inside the warehouse (especially near roof and walls) at different times of the day in relation to outside temperatures during the same period of time. For Example: if the temperature and conditions on a given day at 2 p.m. are 90 degrees Fahrenheit, 85% humidity with a cloudless sky, what is the temperature and humidity extremes at various points in the warehouse, especially the wall facing the sun and the peak of the roof.

c. The possible effects on inside temperature and humidity at different times of the day if the warehouse were closed down for extended periods of time with all doors closed, i.e. weekends or longer periods of time.

d. The possibility of condensation forming on the inside of the metal roof surface or walls due to hot, moist air (if any) rising in the warehouse late in the day or early evening and coming into contact with the cooled metal surfaces.

e. A detailed explanation of what action must be taken at a specific facility to adequately protect the household goods from extreme heat, cold and high humidity, as might be taken by a reasonable careful member.

The above is not an all-inclusive listing of areas to be addressed, but merely intended for guidance. Please keep in mind that generalized statements concerning the existence of a specific system, e.g. ventilation/exhaust systems is not acceptable, unless specific information concerning its operation and its effects on the warehouse environment in relation to controlling or reducing extreme heat, cold or humidity is documented.

The thickness or "R" factor of insulation will be determined by the agent/contractor based on local climatic conditions. If spray-on insulation is being considered, contact the RSMO for Guidance.

L. FIRE PROTECTION:

1. ALL BUILDINGS ENTERING THE SIT/NTS PROGRAM MUST HAVE A SPRINKLER OR DETECTION AND REPORTING (D&R) SYSTEM THAT IS RECOGNIZED AND IS RECEIVING RATE CREDIT BY THE APPROPRIATE INSURANCE RATING ORGANIZATION (ISO).

2. SPRINKLER SYSTEMS. Sprinkler systems may be wet (water in lines) or dry (air in lines). Wet systems are utilized in heated building or in areas that are not subject to freezing temperatures. Sprinkler systems may also be supervised (alarm rings at Central Station) or unsupervised (Local Alarm). SPRINKLER SYSTEMS ARE REQUIRED TO BE INSPECTED QUARTERLY BY A QUALIFIED COMPANY. USUALLY THE ONE WHO INSTALLED THE SYSTEM. IF THE SPRINKLER SYSTEM IS SUPERVISED THE SUPERVISED (ALARM) PORTION OF THE SYSTEM MUST BE INSPECTED ON A MONTHLY BASIS BY A QUALIFIED COMPANY.

3. DETECTION AND REPORT SYSTEMS. These systems are sensitive to heat and/or smoke and will sound an alarm at a central reporting station when activated. Although the weight limit in warehouse protected by D&Rs is much less than those with sprinklers (1,000,000 – 1,500,000 VS 600,000) the cost of installation and maintenance is usually substantially lower. D&R SYSTEMS MUST BE INSPECTED MONTHLY BY A QUALIFIED COMPANY.

4. FIRE PROTECTION SYSTEM RATINGS: All fire protection systems must receive rate credit by the appropriate insurance rating organization. This information must be obtained from your insurance company. The insurance services office will not inspect a new building until it is completed and the system installed. They have very specific standards for rate credit so it is wise to carefully supervise the purchase and installation of your system.

5. FIRE DEPARTMENTS: The following questions should be answered by your service fire department.

- a. Type of Department (paid/volunteer) _____
- b. Number of employees _____
- c. Distance from warehouse to nearest fire hydrant (Max. 500 ft. _____
- d. Size of Water Main _____
- e. Water pressure and flow at the hydrant _____
- f. Estimated time for Fire Department to reach warehouse, hook-up connections, etc. and be ready to fight the fire. _____

- g. Source of water supply _____
- h. Is water supply sufficient to sustain a fire fighting effort at the warehouse _____
- i. Does warehouse conform to all fire safety regulations. _____
- j. Fire Department ISO rating City/County _____
- j. Certification that Fire Division Walls within the facility is unbroken without openings, _____

Page 7, Guidelines for Warehouse Construction, doors or windows and meet a minimum fire resistance of not less than one-hour. _____

6. VEHICLE MAINTENANCE/GARAGING. Garaging and/or maintenance of vehicles are prohibited unless that area is separated from the approved storage area by a solid wall with a 2 (two) hour fire resistance rating.

7. MULTI-OCCUPIED BUILDING. Separation from other occupants of the facility, in the case of a multi-occupied building, must be with a solid wall with a minimum 1-hour fire resistance rating. This wall should not have any doors or openings of any type. All walls separating occupants must be certified as having a one hour fire resistance rating by the local fire department, building contractor or city engineer.

WAREHOUSES MUST MEET LOCAL AND NATIONAL FIRE SAFETY CODES.

M. SECURITY:

1. Consideration should be given to fencing all but the visitor and employee parking areas. Security lights, private patrols and even watchdogs are further deterrents to crime. Visit the servicing police department for patrol information and possible security checks.

2. WAREHOUSE EXTERIOR DOORS MUST HAVE 2 (TWO) KEYED LOCKING DEVICES THIS INCLUDES LOADING AS WELL AS PERSONNEL DOORS. WAREHOUSE WINDOWS MUST BE PROTECTED FROM SIMPLE BREAK-IN BY WIRE MESH OR CHAIN LINK, BARS, HEAVY METAL STRIPS, ETC. NON-BREAKABLE SAFETY GLASS IS ALSO ACCEPTABLE. SKYLIGHTS, TRAP DOORS, ETC. MUST ALSO BE SECURE.

3. OFFICE WINDOWS AND DOORS MUST BE SECURED AS STATED ABOVE UNLESS THE DOORS BETWEEN OFFICE AND WAREHOUSE ARE SOLID WOOD OR METAL AND HAVE 2 (TWO) KEYED LOCKING DEVICES. This is only acceptable when the office ceiling is solid and not a dropped ceiling suspended on wires from the roof.

4. Burglar alarms that are tied into Central Reporting Stations may be substituted for the second lock on doors and additional security on windows. Alarms range from contact points, raise of heat, motion and sound or light beams. Discussion with local alarm companies can determine the best system for your facility.

CHECKLIST FOR WAREHOUSE APPROVAL

The RSMO does not recommend any specific type of building construction. Each building whether concrete, metal or heavy mill construction, is considered on its own merits.

The Western RSMO will forward a package to you containing the requirements for approving your facility. This checklist is designed for your general information and does not supercede specific requirements in the DTR Regulation 4500 9-R Part 4. We suggest that you do not commit money to meet approval requirements until you and the Western RSMO are certain that it is absolutely required for approval and that you have Page 8, Guidelines for Warehouse Construction, successfully met all other prerequisites. Refer to your pre-award correspondence to see which items listed below apply to the Storage-In-Transit (SIT), Non-Temporary Storage (NTS) programs or both.

I. BUILDING

- Fire System Maintenance Contract
- Fire Department Letter
- ISO Credit, Fire Protection System
- Warehouse Lease
- Locator System Layout
- On-Site Inspection
- 100-Yr Flood Plain Study
- Pest Control Program
- Separation from other occupants' (Firewall Certificate)
- Warehouse Layout Diagram
- Map Showing Whse Location

II. ADMINISTRATIVE

- Collective Bargaining Agreement
- Credit Letter
- Equipment Listing
- Financial Statements
- Insurance Certificate
- List of Employee and Titles
- Letter of Intent
- Operating Authority (ICC/State)
- Standard Carrier Alpha Code
- Articles of Incorporation/partnership agreement as applicable

APPLICABLE REGULATON/STANDARDS:

- Defense Transportation Regulation (4500.9-R), Appendix D and E
- National Fire Protection Association Publications
- Local and National Codes/Standards

SUMMARY:

Standards for facilities storing DOD Personal Property are constantly being reviewed. It must be remembered that these guidelines are just that, guidelines, not hard, Page 9, Guidelines for Warehouse Construction, cont'd

fast requirements. It is the responsibility of the RSMO to determine if the potential warehouse, in their judgement, will adequately protect the property to be stored. In order to make this determination many factors must be considered. You should not expend significant funds based on these guidelines until discussions are held with the RSMO Storage Specialists.