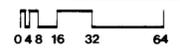


FLOOR PLAN



Functional and Operational Requirements:

The overall functional objective of this definitive design is to provide a building capable of meeting the Department of the Army's General Purpose Warehousing requirements. The basic facility shown herein of 120,000 square feet and 24 feet clear height should serve most installations with little or no change; however, it should be recognized that the building may be scoped downward or upward in both "area" and "cube" to meet the more defined site specific requirements. The use of more efficient and more sophisticated materials handling equipment may affect the column spacing (grid layout) which could require adjustment accordingly. With these variables in mind, the definitive design was developed to provide the maximum degree of flexibility that would be necessary to satisfy installation and site specific requirements.

The functional relationships were developed to provide the most efficient operational adjacencies for this type of facility. The basic building was conceived essentially as a square configuration as this is acknowledged to be not only the most cost effective for construction costs and energy consumption, but also the most efficient for the facilities' internal material handling use and circulation. The centralized shipping and receiving areas, together with the logistics/administration area, provide the degree of control desired in addition to providing efficient access to all areas of the building. This relationship provides an excellent method of satisfying the "JIT Principle" -- Just In Time -- whereby products brought into receiving that are to flow out promptly without going into storage can be accommodated in this centralized area with a minimum of handling once inside the building. The configurations further serve the "ABC Principle" of warehousing which requires that short term turn-around items be held in storage nearby, while the medium and longer term storage items be located progressively further into the recesses of the building.

The logistics/administrative core physically separates the shipping and receiving areas and provides the support required for the operation of the facility. The core provides shipping and receiving offices; acceptance and quality control; order assembly; parcel post area; restrooms; lockers; lunch break, training and conference room; warehouse supervisor's office; material information center; and general offices. This core area is at dock level with a mezzanine above and is accessible to the physically handicapped, as is the balance of the facility. This core area may be adjusted in size to suit site specific mission requirements. In the case of depot level storage, this core area may not be required; or possibly a one-person prefabricated office module could suffice.

Immediately adjacent to the logistics/administration core are the main power panels; distribution panels for the electrical service; fire alarm control panel and telephone panels.

Other activities such as the packing and crating shop, special pilferable storage, humidity controlled area, or even a refrigerated area, can be readily integrated into the plan where required. Safety for personnel and building contents provided through appropriate alarms; fire protection sprinkler systems; and fire exits and access, all conforming to NFPA. The building has been separated by 4-hour fire walls with each area containing a maximum of 40,000 square feet as required by the Architectural and Engineering Instructions.

Externally, the major functional areas provide separated shipping and receiving truck docks with ample hardstand paving and vehicle maneuvering area. Access ramps at the front and side provide for vehicular and/or fork lift access from ground level to dock level. The side ramp may prove particularly useful in handling long, unwieldy items. To further enhance materials handling of bulky materials and flat bed unloading, a dock-high loading platform has been provided. This platform permits both end and side loading/unloading capabilities. This platform may be positioned on either the shipping or receiving side of facility. Overflow or other temporary storage may be stored within the fenced side yard of the warehouse.

One of the most critical factors in the development of the layout for a Standard General Purpose Warehouse is the relationship between actual equipment dimensions and performance characteristics and the building dimensions. With numerous types of fork lifts, styles and types of racks and shelves available on the open market, few conform to any industry-wide dimensional standards. Different makes and styles of fork lift trucks require different aisle widths and turning radii. Racks and shelves have a variety of internal dimensions, such as column and rail depths, shelf and rail spacing, etc. Many equipment and storage system option dimensions can be normalized so that the handling and storage modules will fit most of the available classes of equipment; however, since this is not always practical, it is essential that the user, considering application of the proposed layout grids, check locally and define dimensions of the selected equipment and the building(s) under study before commitment of funds to an installation design.

The dimensional limitations and structural design characteristics of the building will be impressed upon the warehousing methods utilized and material handling equipment (MHE) parameters. The relationship between the pallet or tote box, the racks, the fork lift truck or Automated Storage and Retrieval System (AS/RS) devices and the aisles and overhead clearances must first be established for optimum materials handling and storage efficiency and fit the column pattern, bay spacing, storage height (SH), and building envelope. The final structural configuration of the building must be designed to fit the optimum material handling equipment system being considered for the specific project requirements.

In summary, the functional and operational requirements of the Standard General Purpose Warehouse require that the final design be based on the characteristics of the material being handled and stored (shape, environment, stackability, etc.); the volume and flow pattern through the facility (transaction and cube movement rate); and the inventory pattern (item count, item cube, quantity mix, and inventory turnover patterns). These factors are a function of the installation's mission and can change with time and conditions. Thus, the design must be based upon common denominator criteria with built-in fail-safe reliability and flexibility to accommodate all conditions of material mix, movement, mission configuration, and level of activity.

Architectural Design Objectives

The architectural design objective of the definitive design is to delineate a General Purpose Warehouse prototype with related site features that may be adapted to a variety of locations on a worldwide basis. The definitive design has been developed with flexibility in mind to permit its adaptation to the numerous conditions and differing warehousing requirements anticipated for this type of facility. Insofar as this facility is to serve two different category codes, 44110 and 44220 and will be developed around a variety of materials handling systems and operational requirements for anywhere from large depot level installations to the considerably smaller installations, the definitive must be flexible enough to adapt to the many combinations possible.

While warehouses, by the very nature of their highly functional characteristics essentially dictate size and configuration, it is still incumbent upon the design agency in the final design to develop the buildings' external appearance to express a feeling of order, strength and simplicity. The designer of the final product shall pay particular attention to the buildings' exterior treatment and develop an appearance that will harmonize with other contiguous located facilities. This can be accomplished through the selection of materials, colors, decorative banding, or differing treatments for the clerestory portions of the facilities and even signage. Building siting should not only be established based upon optimal conditions pertaining to weather exposure, but also to provide appropriate relationship to the installation's traffic patterns and to other support warehousing and logistics facilities. An effort has been made in this definitive design package to improve the "quality of life" associated with these warehouses. Traditionally, these facilities have been produced to suit function only with little thought devoted to "quality of life," area enhancements or overall facility appearance. This facility, when properly configured and thoughtfully designed, can function efficiently and effectively as a General Purpose Warehouse and enhance the general area in which it is sited.

Internally, the facility is, in essence, three areas, separated by 4-hour fire walls per requirements stipulated in the Architectural and Engineering Instructions. These fire walls may be waived for installations where certain conditions are met. Refer to "Options" descriptions on Sheet Number 7. Fire walls present a formidable barrier to efficient space utilization and material handling methods; however, the judicious use and spacing of approved fire doors can greatly enhance the functional circulation throughout the building. Aisle patterns, once determined will establish the fire door locations.

The Logistics/Administrative core, located in the central portion of the forward 40,000 square foot area, represents the operational and physical focal point for this facility. Its location, with respect to shipping and receiving, permits close control over all major activities. Its two-story construction and the mezzanine level viewing deck present a commanding visual effect that literally says, "This is the Control Center."

In the selection of the interior treatment, the design agency shall work with colors and materials that are light and bright, plus having low maintenance characteristics. Flow patterns should be well marked on the floors and protective bollards placed where potential vehicular impact would cause internal damage. Wall facings shall be of durable, damage resistant materials to a minimum height of 14 feet above floor line.

At the using agencies choice, the interior lighting of the facility can be greatly enhanced through the use of ultra-violet resistant and ultra-violet screening insulated translucent panels at the clerestory level. Further, if smoke vents are required, natural light throughout the entire facility can be achieved through use of ultra-violet resistant and ultra-violet screening translucent panels at the smoke vents located in the roof area. This natural lighting will greatly enhance the quality of life for personnel assigned to these facilities and could represent some energy cost savings.

GENERAL NOTES

- A. GROSS BUILDING AREA:**
- PRIMARY CONFIGURATION**
- o Logistics/Administration support area:
 - Mezzanine level area = 2,635 S.F.
 - Dock level area = 2,285 S.F.
 - o Gross warehouse area = 115,155 S.F.
 - o Total gross floor area = 120,075 S.F.
 - o Building "footprint" area = 117,445 S.F.
- B. NOTES:**
1. This Standard General Purpose Warehouse is to be a group "B" occupancy, Division 2, per UBC, for storage of combustible goods. The construction type shall be II-N, noncombustible construction for the 24 foot and 34 foot clear height option and type II, 1-hour for 60 foot option.
 2. The column spacing of 64 feet x 33 feet represents a grid pattern that serves numerous storage/aisle/MHE configurations effectively. This grid pattern may be adjusted for final design where site specific warehouse planning indicates a grid that will more effectively serve the precise materials handling equipment and storage racks selected.
 3. This facility may be programmed in area incremental increases or decreases to provide a building area between 40,000 to 240,000 S.F. Refer to Sheet number 7. Other modular arrangements will work also.
 4. This facility may be programmed in vertical modules of the basic "clear height" of 24 feet, or two (2) optional heights of 34 feet or 60 feet clear height, or a combination of these heights.
 5. The Warehouse should be site oriented to take maximum advantage of existing conditions. Plan elements may be reversed or adjusted to satisfy site specific and local requirements.
 6. "Special use" areas are not contained in a standard General Purpose Warehouse; they may be programmed during final design on a site specific basis.
 7. Logistics Administration/Support areas, as shown, are to be provided as stipulated by activity requirements.
 8. All areas of building shall be provided with automatic sprinklers.
 9. Architectural treatment, materials framing, and construction may vary.
 10. Positive roof slope and complete roof drainage is required. A minimum roof slope of one-half inch per foot is recommended.
 11. Warehouse floor live load 250 P.S.F. minimum. The floor load depends upon material handling equipment (M.H.E.) and product being stored. Mezzanine and administrative floor live load: 100 P.S.F. minimum.
 12. Aisle width and locations have not been designated as the specific directions and requirements will vary directly with the storage system employed and the M.H.E. selected. Final design shall address these site specific issues.
 13. Dock seals and bumper guards shall be provided at all truck dock openings.
- C. INFORMATION SYSTEMS:**
- Information System provisions will consist of terminal/concentrator cabinets, raceways, outlet boxes and device plates, and underground access to the exterior installations Information System. Information System outlets will be provided for administrative work stations and other locations designated by the using service. The location of cabinets and outlets for Information Systems will be coordinated with the local Director of Information Management.
- D. HEATING/ELECTRICAL REQUIREMENTS:**
- Refer to Sheets No. 5 and 6 respectively.

Revisions			
Symbol	Descriptions	Date	Approved

U. S. ARMY
ENGINEER DISTRICT, SEATTLE
CORPS OF ENGINEERS
SEATTLE, WASHINGTON

Designed by:
LDC

Drawn by:
KNY

Checked by:
LDC/DHH

Reviewed by:

Submitted by:

DEPARTMENT OF THE ARMY
FACILITIES STANDARDIZATION PROGRAM
DEFINITIVE DESIGN

GENERAL PURPOSE WAREHOUSE

Scale:	As shown	Sheet number:	3
Spec. No.		Drawing number:	
Contract No.	DACA 87-86-D-0028		44110-01 44220-01