

**WAREHOUSE CONSIDERATIONS/SYSTEMS**

THE WAREHOUSE DESIGNS HAVE BEEN DEVELOPED USING THE STATE-OF-THE-ART STORAGE AIDS AND MATERIAL HANDLING EQUIPMENT BASED ON THE RANGE OF STORAGE INVENTORIES AND THROUGHPUT REQUIRED FOR A SMALL, MEDIUM AND LARGE TISA. THE STORAGE LAYOUT OPTIMIZES THE MINI/MAXI MART CONCEPTS OF CUSTOMER SELF SERVICE ISSUE WITHIN AN EFFICIENT PALLETIZED UNIT LOAD STORAGE WAREHOUSE WITH MAXIMUM EXPANDABILITY. THE INCLUSION OF AN ISSUE SELECTION CORRIDOR WITH GLASS PANEL DOORS PROVIDES ACCESS TO REFRIGERATED STOCK ITEMS WITHOUT SPECIAL CLOTHING.

THE SMALL TISA WAREHOUSE THROUGHPUT RATE IS SUCH THAT THE USE OF MULTIPLE TYPES OF MATERIAL HANDLING VEHICLES, ONE TYPE FOR DOCK OPERATIONS AND AN ALTERNATE TYPE FOR STORAGE SUPPORT OPERATIONS, WOULD PRODUCE LOW UTILIZATION OF EACH TYPE VEHICLE AND A LOSS IN PRODUCTIVITY WHEN AN OPERATOR CHANGES VEHICLES. THE COUNTERBALANCED FORKLIFT VEHICLE ACCOMMODATES VEHICLE LOADING/UNLOADING AS WELL AS THE STORAGE RELATED FUNCTIONS IN SINGLE DEEP PALLET RACK IN A 12 FOOT STORAGE AND END AISLES. ELECTRIC PALLET TRANSPORTERS (PALLET JACKS) ARE UTILIZED TO SUPPORT ISSUE FUNCTIONS IN THE STORAGE AREA (S) NOT INCLUDED IN THE MINI/MAXI MART CONCEPT. FOUR (4) WHEEL CARTS ARE TO BE UTILIZED BY MINI/MAXI MART CUSTOMERS.

THE MEDIUM AND LARGE TISA WAREHOUSE STORAGE SYSTEM UTILIZES A COMBINATION OF DOUBLE DEEP AND SINGLE DEEP PALLET RACK TO EFFICIENTLY STORE LARGER INVENTORY LOTS AT A HIGHER TURNOVER RATE WITH A DEEP REACH FORKLIFT OPERATING IN A 10 FOOT WIDE AISLE. THE AISLE SUPPORTING THE DRIVE-IN RACK FOR MRE, T-RATION AND VEGETABLE AND FRUIT COOLERS ARE 12 FOOT WIDE TO ALLOW OPTIONAL DIRECT STORAGE TO VEHICLE LOADING FOR CONTINGENCY SITUATIONS. END AISLES ARE 12 FEET WIDE TO ALLOW EASY VEHICLE TURNS. COUNTERBALANCED FORKLIFTS ARE USED TO LOAD AND UNLOAD VEHICLES AT THE DOCK DOORS. ELECTRIC PALLET TRANSPORTERS (PALLET JACKS) ARE UTILIZED TO SUPPORT ISSUE FUNCTIONS BY A WAREHOUSEMAN IN THE STORAGE AREAS NOT INCLUDED IN THE MINI/MAXI MART CONCEPT. FOUR (4) WHEEL CARTS ARE UTILIZED BY MINI/MAXI MART CUSTOMERS.

INVENTORY IS STORED IN STORAGE RACKS WITHIN A VERTICAL STORAGE ZONE CONCEPT. THE FIRST AND SECOND LEVELS OF THE SINGLE AND DOUBLE DEEP ARE USED AS ISSUE PICK LOCATIONS. THE THIRD LEVEL AND ABOVE ARE USED FOR RESERVE STOCK STORAGE AND ANY REMAINING CAPACITY ABOVE THE STOCK RESERVE FOR STORAGE OF MRE, T-RATIONS AND T-RATION SUPPORT ITEMS. ADDITIONAL STORAGE CAPACITY FOR MRE, T-RATIONS AND T-RATION SUPPORT ITEMS IS PROVIDED IN DRIVE-IN RACK. CASE FLOW RACK PROVIDES ONE LANE FOR FULL CASES AND ANOTHER FOR OPEN CASES FOR THOSE INVENTORY ITEMS WITH VERY SMALL INVENTORIES. AS AN OPTION, THE CASE FLOW RACK CAN BE INCREASED TO PROVIDE ISSUE LOCATIONS FOR ALL STOCK ITEMS STORED IN THE SECOND LEVEL PALLET LOCATIONS.

A COMPUTERIZED INTERACTIVE STOCK LOCATOR SYSTEM IN COMBINATION WITH A SINGLE DEEP PALLET RACK AND MULTIPLE DEEP DRIVE-IN PALLET RACK (WHEN REQUIRED FOR LARGE QUANTITIES OF MRE & T-RATIONS) PROVIDES FOR EFFICIENT UTILIZATION OF STORAGE SPACE AND IMPROVED MANAGEMENT CONTROL. PORTABLE HAND HELD COMPUTER TERMINALS WITH BAR CODE READERS ARE UTILIZED FOR PHYSICAL INVENTORY VALIDATION, RECEIPT TAKE-UP, MINI/MAXI/MART CHECK-OUT AND VETERINARY INSPECTION OF STOCK.

RECEIPTS ARE UNLOADED AND STAGED ON THE DOCK FOR VETERINARY INSPECTION. AFTER INSPECTION, MATERIAL IS STORED IN LOCATIONS DETERMINED BY COMPUTER WITH DESIGNATED ZONES BASED ON COMMODITY AND ISSUE FREQUENCY CONSIDERATIONS. ORDER SELECTION IS FROM PALLETS AND FLOW RACK AT FLOOR LEVEL WITH SOME SLOW MOVING ITEMS WITH 1/2 PALLET OR LESS QUANTITIES ON THE SECOND LEVEL. UNIT PILES, IF USED, ARE STORED IN THE DOCK AREA ALONG THE CIRCULATION ZONE AISLE.

A STOCK SELECTOR VEHICLE IS AN OPTION TO ASSIST IN THE REPLISHMENT OF CASE FLOW RACK AND INSPECTION OF INVENTORY. THE STORAGE OF POTATOES AND/OR ONIONS FOR MEDIUM AND LARGE WAREHOUSES COULD BE LOCATED IN THE REFRIGERATED DOCK AREA AS AN OPTION DEPENDENT ON THE STORAGE INVENTORY REQUIREMENTS.

PALLET RACK MAY BE UTILIZED ABOVE THE DOCK DOORS FOR STORAGE OF EMPTY PALLETS. DESIGN OF THE STORAGE AID SYSTEMS WITHIN VARIOUS SEISMIC ZONES SHALL BE IN ACCORDANCE WITH UBC AND THE RACK MANUFACTURERS INSTITUTE (RMI).

**BUILDING DATA**

AREA	NO. SPACE	NET S.F.
<b>STORAGE AREAS</b>		
1	DRY STORAGE	16,692
2	HARDY VEGETABLE & FRUIT COOLER	2,155
3	SENSITIVE VEGETABLE & FRUIT COOLER	2,155
4	ONIONS & POTATOES	3,066
5	PERISHABLE COOLER	4,647
6	FREEZER	8,978
<b>ADMINISTRATIVE AREA</b>		
7	VENDING	18
8	BREAK/TRAINING	172
9	CONFERENCE ROOM	316
10	MEN-TLTS & LOCKERS	177
11	WOMEN-TLTS & LOCKERS	177
12	TISO	115
13	GENERAL ADMIN (12-18)	1,157
14	STORAGE	122
<b>WAREHOUSE OFFICE AREA</b>		
15	WHSE OFFICE (4)	444
16	DRIVER WAITING	81
17	INSPECTION ROOM	160
18	VETERINARY OFFICE	99
<b>SUPPORT</b>		
19	CART STORAGE	
20	UNIT PILE	
21	MHE STORAGE, BATTERY CHARGING	
22	STAGING, HOLDING, VET INSPECTION	
a.	DRY DOCK	
b.	CHILLED DOCK 45°F	
23	SALVAGE AREA (SEE SHT 2 NARRATIVE)	12,014
TOTAL FOR DOCK CIRCULATION AND ACTIVITIES		
24	EQUIPMENT MEZZANINE	1,235
25	MAXI-MART AISLE 45°F	1,505
26	JANITOR CLOSET (2)	68
27	SPRINKLER VALVE ROOM	16
28	SERVICE AISLE (COOLERS) WALL THICKNESS, ETC.	2,768
GROSS SQUARE FEET (TOTAL)		59,627

**TROOP CAPACITY PERSONNEL**

BARRACK CAPACITY	15,000	ADMINISTRATION	
CASH SALES (15%)	2,138 *	TISO	1
HOSPITALS	400	ADMIN. STAFF (8-11)	11
RESERVES (WEEKEND)	2,500	WAREHOUSE	
RESERVES (14 DAY)	2,500	OFFICE	3
T-RATIONS	5,000	WAREHOUSEMEN (WITH MINI/MAXI)	8
MRE'S	5,000		
B-RATIONS	-0-	VETERINARY STAFF	2

\* .15 OF 70% OR 95% BARRACK CAPACITY

**STORAGE CAPACITIES**

STORAGE AREA	PALLETS	FLOW LANES
DRY - A-RATIONS	1,327	140
DRY - MRE & T-RATIONS	1,069	N/A
FREEZER	860	320
COOLER - PERISHABLE	500	100
COOLER - SENSITIVE V & F	140	60
COOLER - HARDY V & F	140	60
ONION & POTATOES	260	0

**MATERIAL HANDLING EQUIPMENT**

FOUR WHEEL CARTS	**
PALLET TRANSPORTERS	1
3000 lb CAPACITY	
COUNTERBALANCED FORKLIFT	2
3000 lb CAPACITY/15'-6" HEIGHT	
DOUBLE DEEP FORKLIFT	4
3000 lb CAPACITY/20'-6" HEIGHT	
STOCK SELECTOR	OPTIONAL
3000 lb CAPACITY/20'-0" HEIGHT	

**STORAGE AIDS**

<b>PALLET RACK</b>	
SINGLE DEEP	945
DOUBLE DEEP	2,876
<b>DRIVE-IN</b>	
2 DEEP	260
3 DEEP	300
4 DEEP	0
<b>CASE FLOW RACK</b>	
20 FACES	560
15 FACES	120

\*\* TO BE DETERMINED BY TISA PERSONNEL BASED ON THE ISSUE SCHEDULE AND EXTENT OF MINI/AND/OR MAXI MART USE.

ALL MATERIAL HANDLING EQUIPMENT SHALL BE PROVIDED WITH A COLD PACKAGE.

REV	DATE	DESCRIPTION	BY	APP

WOLFBERG/ALVAREZ & ASSOCIATES  
ARCHITECTURE + ENGINEERING + PLANNING  
ARLINGTON, VIRGINIA

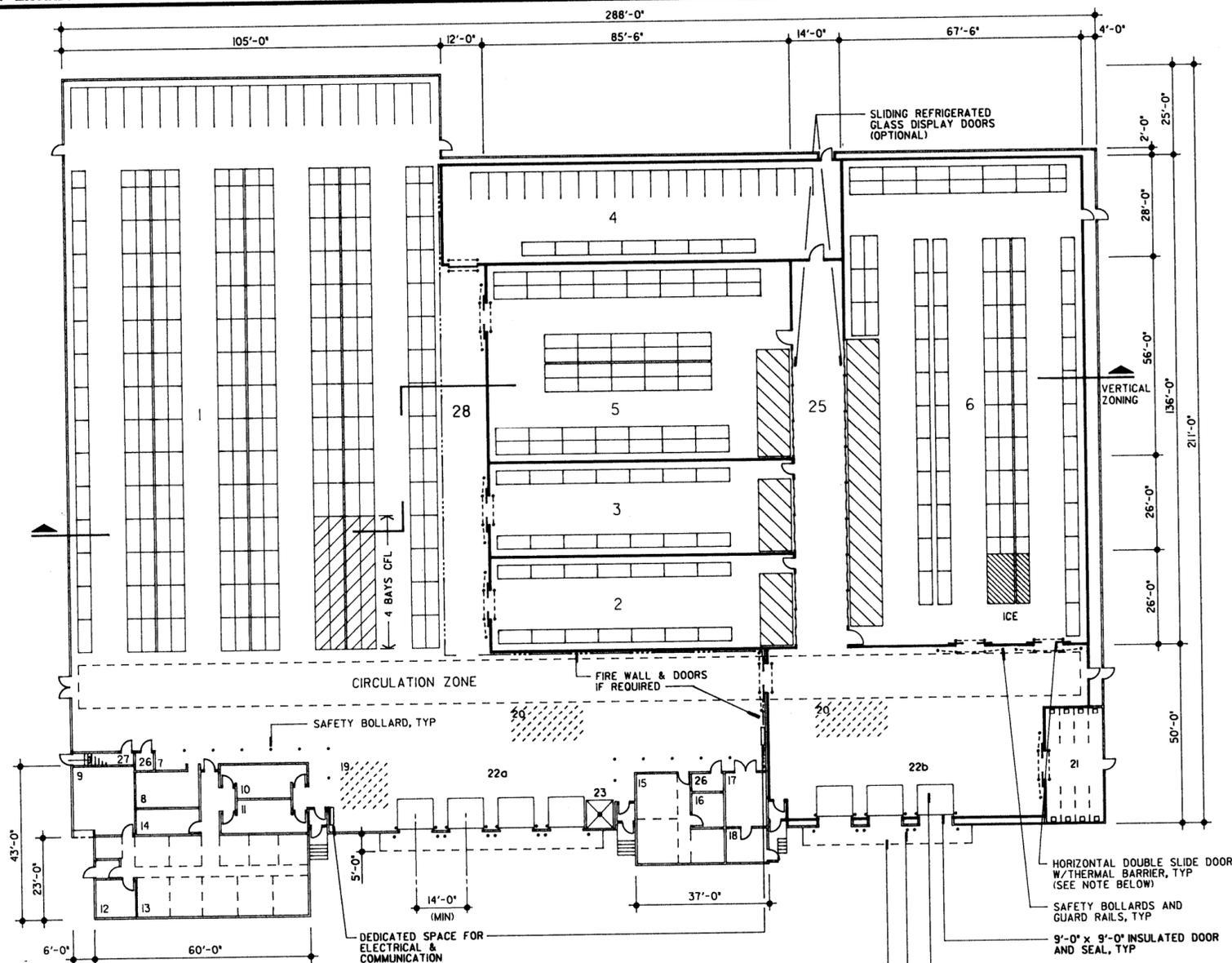
DEPARTMENT OF THE ARMY  
NORFOLK DISTRICT CORPS OF ENGINEERS  
NORFOLK, VA.

DESIGNED: W/A & A  
DRAWN: CADD  
CHK'D: PM  
SUBMITTED: MK

DEPARTMENT OF THE ARMY  
FACILITIES STANDARDIZATION PROGRAM  
DEFINITIVE DESIGN

TISA  
TROOP ISSUE SUBSISTENCE ACTIVITY  
COLD/DRY STORAGE FACILITY

SCALE: AS SHOWN TO ACCOMPANY SPECIFICATION NO. PROJECT NO. DEF 432-11-01  
DATE: OCTOBER 1988 DRAWING NO. 5

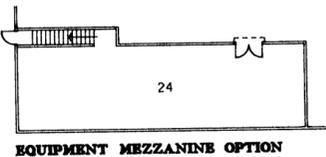


**FLOOR PLAN MEDIUM TISA**

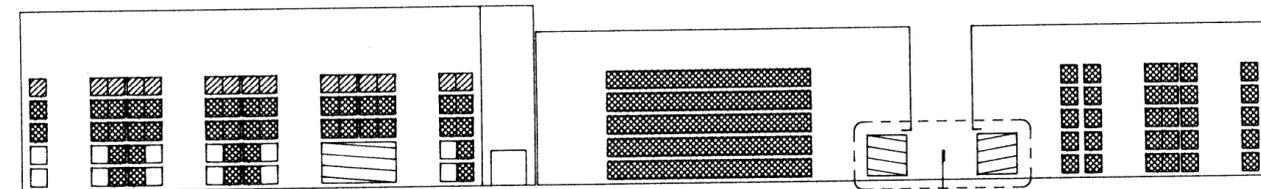
1" = 8' 0" 16' 32' FT.

WALL DESIGNATIONS  
NONCOMBUSTIBLE WAREHOUSE ENVELOPE  
FOAMED-IN-PLACE METAL SANDWICH PANEL  
FIRE WALL & DOORS IF REQUIRED

NOTE: INTERIOR DOORS TO THE COOLERS, FREEZER, CHILLED DOCK AND ENCLOSED MHE STORAGE ARE SIMILAR OTHER THAN DOOR ACTION WHICH MAY BE SINGLE SLIDE OR VERTICAL AS INDICATED.



**EQUIPMENT MEZZANINE OPTION**



**VERTICAL ZONING**

▨ MRE & T-RATIONS  
▩ RESERVE A-RATIONS  
▬ CASE FLOW RACKS  
□ PICK POSITION