APPROVED BY	APPROVED BY
U.S. COAST GUARD	BUREAU OF EXPLOSIVES
To. W. J. bren	d. J. Grasmuck
	SUPERVISOR, MILITARY & INTERMODAL SERVICES
DATE 4/1/79	DATE 3/20/79

LOADING AND BRACING WITH WOODEN DUNNAGE<sup>®</sup> IN COMMERCIAL CONTAINERS OF PALLETIZED UNITS OF FUZE, MECHANICAL TIME AND SUPERQUICK (48-BOX PALLET UNIT)

THE DEPICTED WOODEN DUNNAGE METHOD CAN BE APPLIED TO ANY COMMERCIAL INTERMODAL 20-FOOT CONTAINER, ALTHOUGH THE DUNNAGE DIMENSIONS HAVE BEEN GIVEN FOR A 92" WIDE BY 95" HIGH (INSIDE DIMENSIONS) CONTAINER. ALTHOUGH THE LOAD AS SHOWN IS BASED ON AN 8'-0" HIGH CONTAINER IS PREFERRED FOR SHIPPING THE DEPICTED LOAD. WHEN AN 8'-0" HIGH CONTAINER IS USED, THE HEIGHT OF SOME DUNNAGE ASSEMBLIES WILL HAVE TO BE LOWERED BY REMOVING SOME MATERIAL FROM THE TOP OR BOTTOM OF SOME OF THE VERTICAL PIECES.

LOADING AND BRACING SPECIFICATIONS AS DELINEATED HEREIN ARE ADEQUATE FOR SHIPMENTS TO BE MOVED BY ANY SURFACE MODE OF TRANSPORT ( MOTOR, RAIL, AND WATER ).

REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC). SPECIAL T/COFC NOTES FOLLOW.

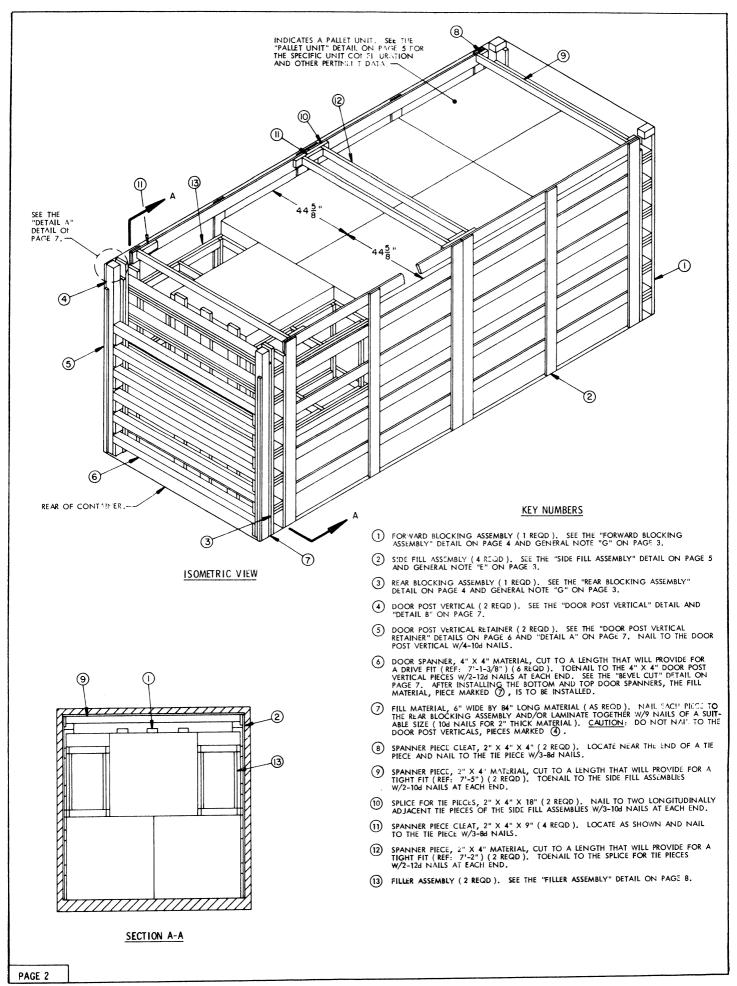
- A. A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC SERVICE.
- B. THE LOAD LIMIT OF A T/COFC RAIL CAR MUST NOT BE EXCEEDED, NOR WILL A CAR BE LOADED SO THAT THE TRUCK UNDER ONE END OF THE CAR CARRIES MORE THAN ONE-HALF OF THE LOAD LIMIT FOR THAT CAR.

DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS/MODIFIED FLAT BED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED.

DETAILS DEPICTING THE USE OF THE NAVY-DEVELOPED INTERNAL RESTRAINT SYSTEM KIT ( IRSKIT ) FOR BLOCKING AND BRACING A LOAD OF AMMUNITION OR AMMUNITION COMPONENTS HAVE BEEN INCLUDED IN THIS DRAWING, IN ADDITION TO THE DELINEATED LOADING AND BRACING PROCEDURES USING THE WOODEN DUNNAGE RESTRAINT SYSTEM. THE IRSKIT SYSTEM WAS DESIGNED AND TESTED BY NAVAL WEAPONS HANDLING LABORATORY, WPNSTA EARLE, COLTS NECK, NJ 07722. FOR DETAIL AND INSTALLATION OF THE IRSKIT SYSTEM, SEE NAVSEA DRAWING NUMBERS NWHC 7712, 7713, 7658, 7659, 7660, 7661, AND 7664.

REVI	SIONS	GRG MUK	WAST AT	
	1	RS#	Dewille	
		APPROVED, U. S. ARMY ARMANENT MATERIEL READINESS COMMAND		
/	1			
			OF COMMANDING GENE ENT AND READINESS	
		Jehn	MY DEPENSE ANNUNIT	ION CENTER AND SCHOOL
		U. S. ARM	Y DARCO	M DRAWING
		١	MAY 197	9
		DEF AMMO	CEN & S	CH DWG NO.
		D-SA	RAC-	4403

DO NOT SCALE



#### ( GENERAL NOTES CONTINUED )

- M. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
  - PREFABRICATE ONE FORWARD BLOCKING ASSEMBLY, FOUR SIDE FILL ASSEMBLIES, AND ONE REAR BLOCKING ASSEMBLY, AND NAIL A DOOR POST VERTICAL RETAINER TO EACH DOOR POST VERTICAL, ONE RIGHT HAND AND ONE LEFT HAND.
  - 2. INSTALL FORWARD BLOCKING ASSEMBLY.
  - 3. INSTALL ONE SIDE FILL ASSEMBLY AND LOAD TWO PALLET UNITS.
  - 4. REPEAT STEP 3.
  - 5. LOAD FOUR PALLET UNITS.
  - 6. REPEAT STEP 3.
  - 7. REPEAT STEP 3.
  - 8. INSTALL THE REMAINING THREE PALLET UNITS AND THE TWO FILLER ASSEMBLIES.
  - 9. INSTALL REAR BLOCKING ASSEMBLY.
  - INSTALL THE TWO DOOR POST VERTICAL ASSEMBLIES (ONE RIGHT HAND AND ONE LEFT HAND).
- 11. INSTALL TWO DOOR SPANNER PIECES (ONE AT THE LOWEST POSITION AND ONE AT THE UPPERMOST POSITION).
- 12. INSTALL THE SOLID FILL TYPE LOAD-BLOCKING MATERIAL.
- INSTALL THE TWO SPLICE PIECES FOR THE TIE PIECES, THE SIX SPANNER
  PIECE CLEATS, AND THE FOUR SPANNER PIECES. SEE " \* " NOTE BELOW.
- INSTALL THE REMAINING FOUR DOOR SPANNER PIECES STARTING WITH THE LOWEST AND WORKING UPWARD TO THE HIGHEST.
- \* IF DESIRED, PIECES MARKED ②, AND ③ THRU ② MAY BE INSTALLED PRIOR TO LOADING A CONTAINER.

BILL OF MATERIAL				
LUMBER	LINEAR FEET BOARD FEET			
1" X 4" 1" X 6" 2" X 2" 2" X 4" 2" X 6" 4" X 4"	9 174 24 156 391 59	3 87 8 104 391 78		
NAILS	NO. REQD	POUNDS		
6d (2") 8d (2-1/2") 10d (3") 12d (3-1/4")	192 18 646 32	1-1/4 1/4 10 1/2		
PLYWOOD, 1/2" 47 SQ FT REQD 65 LBS DOOR POST VERTICAL RETAINER 2 REQD 64 LBS				

## MATERIAL SPECIFICATIONS

LUMBER	: TM 743-200-1 ( DUNNAGE LUMBER ) AND FED SPEC MM-L-751.
<u>PLYWOOD</u>	: FED SPEC NN-P-530; GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
NAILS	: FED SPEC FF-N-105; COMMON.
STEEL, STRUCTURAL	: FED SPEC QQ-S-741; SQUARE STRUCTURAL TUBING AND ROLLED PLATE.

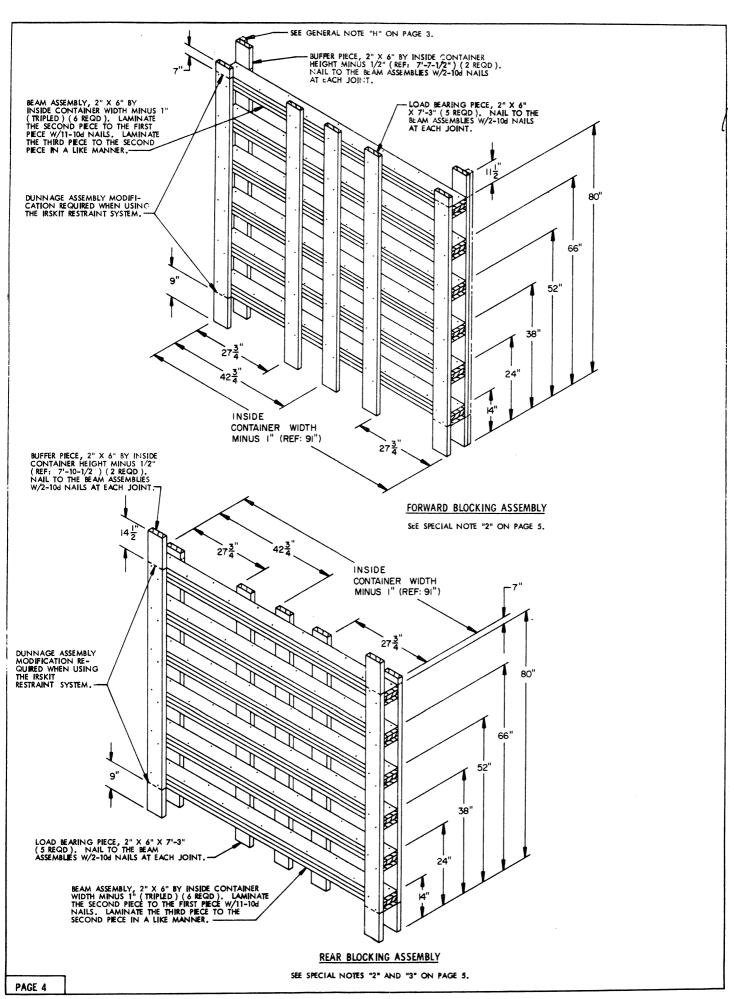
### **GENERAL NOTES**

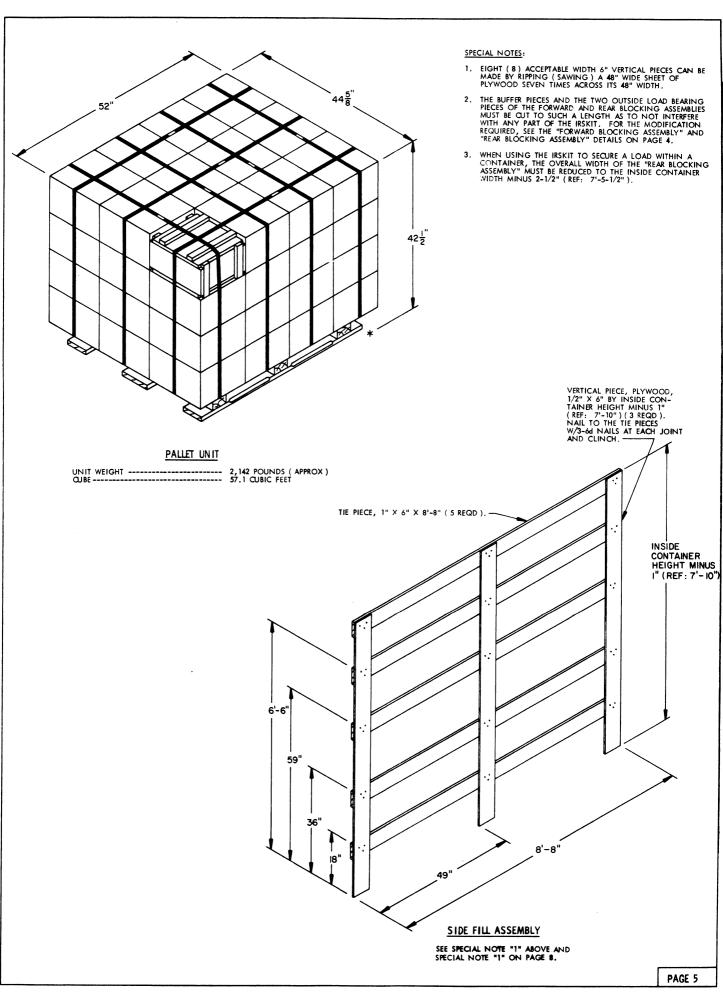
- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 ( CHAPTER 5 ).
- B. IN ADDITION TO THE DELINEATED OUTLOADING PROCEDURES SPECIFYING THE "WOODEN DUNNAGE" METHOD OF BLOCKING AMMUNITION IN COMMERCIAL CONTAINERS, DETAILS DEPICTING THE USE OF THE NAVY-DEVELOPED "IRSKIT" METHOD OF BLOCKING AMMUNITION ARE ALSO INCLUDED.
- C. THE SPECIFIED OUTLOADING PROCEDURE IS APPLICABLE TO A LOAD OF 48-BOX PALLET UNITS OF MECHANICAL TIME AND SUPBRQUICK FUZES. SUBSEQUENT REFERENCE TO PALLET UNIT MEANS THE PALLET UNIT WITH AMMUNITION ITEMS. SEE PAGE 5 FOR DETAILS OF THE PALLET UNIT. CAUTION: REGARDLESS OF THE QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS WEIGHT" OF 44,800 POUNDS MUST NOT BE EXCEEDED.
- D. THE LOAD AS SHOWN IS BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH INTERMODAL COMMERCIAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG 8Y 92" WIDE BY 95" HIGH. THE LOAD IS DESIGNED FOR TRAILER/CONTAINER-ON-FLAT CAR (T/COFC) SHIPMENT, HOWEVER, THE LOAD AS DESIGNED CAN ALSO BE MOVED BY OTHER SURFACE MODES OF TRANSPORT. NOTICE: OTHER CONTAINERS OF THE SAME DESIGN CONFIGURATION CAN BE USED.
- E. WHEN LOADING PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE FORWARD AND SIDE DUNNAGE ASSEMBLIES), ALTHOUGH A TOTAL OF ONE AND ONE-HALF INCHES (1-1/2") OF UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS PERMITTED, LATERAL VOIDS WITHIN THE LOAD ARE TO BE HELD TO A MINIMUM. EXCESSIVE SLACK CAN BE ELIMINATED FROM A LOAD BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE HORIZONTAL PIECES ON A SIDE FILL ASSEMBLY. NAIL EACH ADDITIONAL PIECE TO THE HORIZONTAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12".
- F. DUNNAGE LUMBER SPECIFIED IS OF A NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- G. A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- H. IN SOME CONTAINERS, SUCH AS SOME ALL STEEL CONTAINERS, THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. A PIECE OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD BLOCKING ASSEMBLY TO PROVIDE A FLAT SURFACE FOR THE 2" X 6" BUFFER PIECES. A PIECE OF 2" X 4", 2" X 3", OR A SPECIAL WIDTH PIECE CUT TO FIT CAN BE USED. THIS FILL PIECE WILL BE NAILED WITH ONE APPROPRIATELY SIZED NAIL EVERY 12". THIS PIECE IS NOT REQUIRED WHEN THE FRONT WALL OF THE CONTAINER IS SMOOTH AND FLAT.
- J. CAUTION: DO NOT NAIL DUNNAGE MATERIAL TO THE CONTAINER WALLS OR FLOOR, ALL NAILING WILL BE WITHIN THE DUNNAGE.
- K. PORTIONS OF THE CONTAINERS DEPICTED WITHIN THIS DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- L. TO MAKE LOADING EASIER, TO HELP ACHIEVE A TIGHT LOAD ACROSS A CONTAINER, AND TO PREVENT UNACCEPTABLE DAMAGE TO LADING UNITS WHEN LOADING A CONTAINER, A SLIP-SHEET CAN BE USED EFFECTIVELY AS A "SHOEHORN" TYPE DEVICE. THE SLIP-SHEET WILL PROVIDE A SMOOTH SURFACE THAT WILL PREVENT UNIT STRAPS AND/OR BOX CLEATS FROM INTERLOCKING OR CATCHING ON OTHER PROJECTIONS WHEN LATERALLY ADJACENT LADING UNITS ARE BEING LOADED. A SLIP-SHEET WILL BE USED AFTER ONE-HALF OF A STACK IS LOADED WITH ONE OF ITS SIDES IN TIGHT CONTACT AT ONE SIDE OF THE CONTAINER. THE SLIP-SHEET IS TO BE PLACED AGAINST THE OTHER SIDE OF THE HALF-STACK BEFORE THE LAST HALF OF THE STACK IS LOADED. AFTER A STACK IS COMPLETED, THE SLIP-SHEET IS TO BE REMOVED FOR SUBSEQUENT USE WITH THE NEXT STACK. A SLIP-SHEET OF SUITABLE SIZE CAN BE MADE FROM A SHEET OF 1/8" TEMPERED HARDBOARD (MASONITE) OR FROM A SHEET OF ANY OTHER MATERIAL THAT WILL SATISFY THE REQUIREMENT.

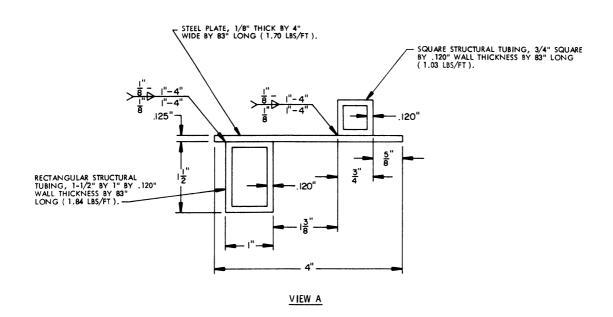
( CONTINUED AT LEFT )

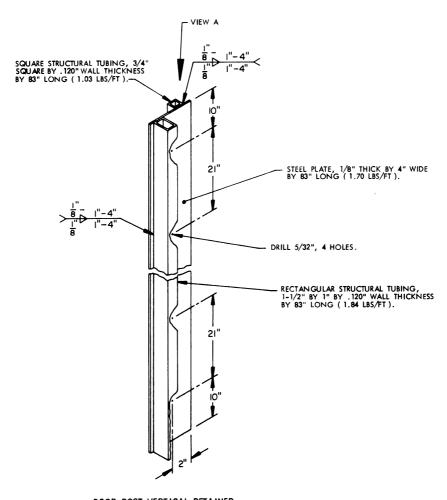
### LOAD AS SHOWN

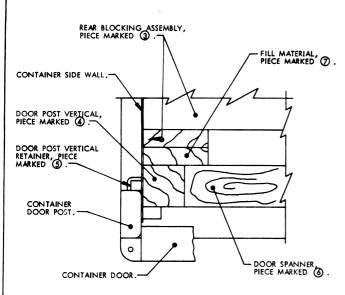
IT EM	QUANTITY	WEIGHT (APPROX)
DUNNA GE	15	
	TOTAL GROSS WEIGHT	38.313 LBS





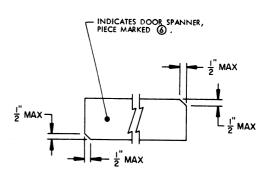






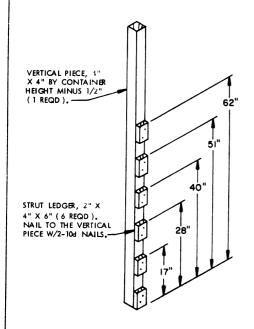
### DETAIL A

A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL AND ADJACENT DUNNAGE PIECES.



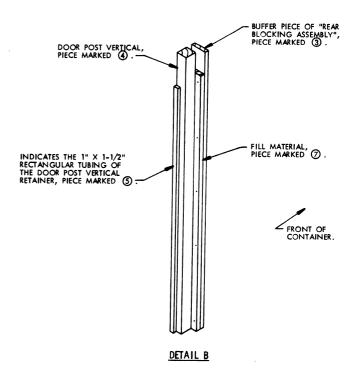
## BEVEL-CUT

IF DESIRED, EACH END OF A DOOR SPANNER PIECE MAY BE BEVEL-OUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT DOOR POST TO DOOR POST FIT.



## DOOR POST VERTICAL

THE STRUT LEDGERS CAN ONLY BE PRE-NAILED TO THE DOOR POST VERTICAL ON ONE SIDE OF THE CONTAINER. THE STRUT LEDGERS ON THE OTHER SIDE ARE TO BE NAILED AFTER A LOWER DOOR SPANNER IS INSTALLED.

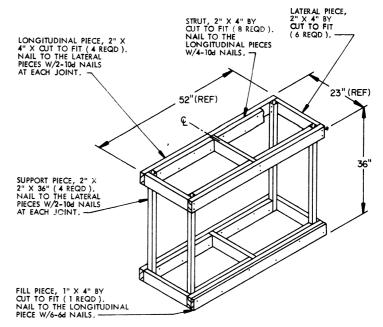


DOOR SPANNERS AND STRUTS HAVE BEEN OMITTED FOR CLARITY PURPOSES.

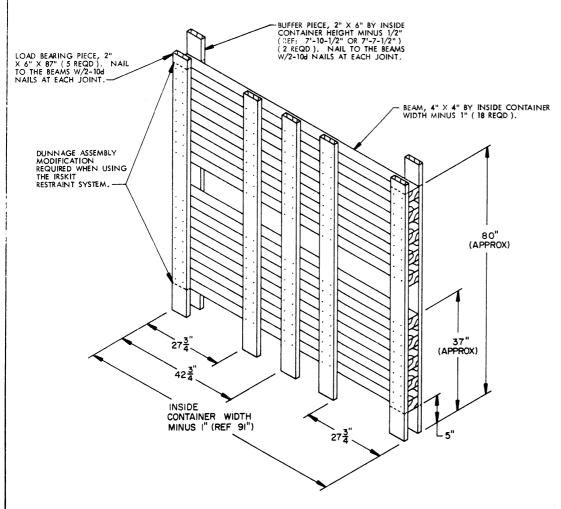
PAGE 7

#### SPECIAL NOTES:

- THE DUNNAGE ASSEMBLIES DETAILED HEREIN HAVE BEEN DIMENSIONED FOR A CONTAINER WITH AN INSIDE HEIGHT OF 95". WHEN THE INSIDE HEIGHT IS GREATER OR LESS THAN 95", THE DUNNAGE ASSEMBLIES MUST BE ADJUSTED AS REQUIRED, TO PROVIDE FOR PROPER HOLD DOWN.
- 2. VARIANCE IN PALLET UNIT DIMENSIONS WILL NECESSITATE ADJUSTMENTS IN DUNNAGE ASSEMBLIES, SEE GENERAL NOTE "E" ON PAGE 3, WHEN THE UNIT WIDTH IS LESS THAN 52", THE FILL MATERIAL, PIECE MARKED () ON PAGE 2, MUST BE INCREASED TO PROVIDE A TIGHT FIT BETWEEN THE REAR BLOCKING ASSEMBLY AND THE DOOR POST VERTICAL. IF THE UNIT WIDTH IS GREATER THAN 52", IT WILL BE NECESSARY TO USE THE "ALTERNATIVE FORWARD/REAR BLOCKING ASSEMBLY", AS DEPICTED BELOW, IN LIEU OF THE "FORWARD BLOCKING ASSEMBLY" AND/OR THE "REAR BLOCKING ASSEMBLY", AS DEPICTED ON PAGE 4.
- 3. THE BUFFER PIECES AND THE TWO OUTSIDE LOAD BEARING PIECES OF THE FORWARD AND REAR BLOCKING ASSEMBLIES MUST BE CUIT TO SUCH A LENGTH AS TO NOT INTERFERE WITH ANY PART OF THE IRSKIT. FOR THE REQUIRED MODIFICATION, SEE THE "ALTERNATIVE FORWARD/REAR BLOCKING ASSEMBLY" DETAIL BELOW.
- WHEN USING THE IRSKIT TO SECURE A LOAD WITHIN A CONTAINER, THE OVERALL WIDTH OF THE REAR BLOCKING ASSEMBLY MUST BE REDUCED TO THE INSIDE CONTAINER WIDTH MINUS 2-1/2" (REF: 7'-5-1/2").

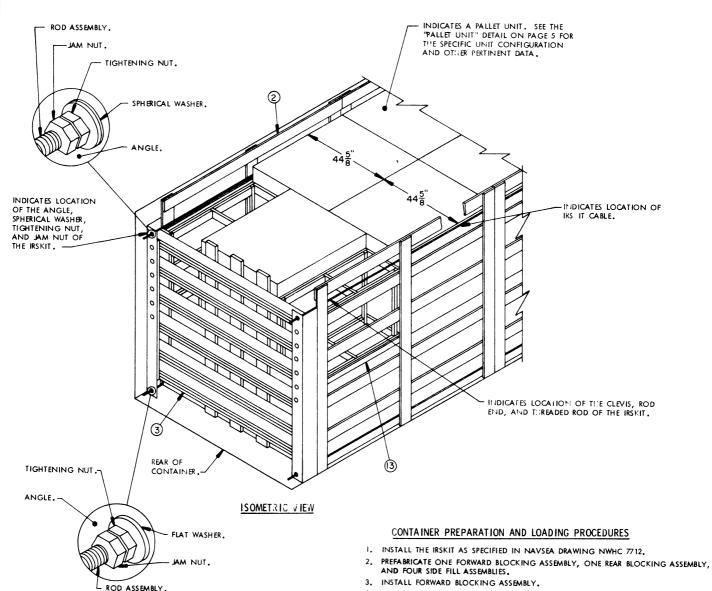


FILLER ASSEMBLY



# ALTERNATIVE FORWARD/REAR BLOCKING ASSEMBLY

SEE SPECIAL NOTES ABOVE.



### SPECIAL NOTES:

- 1. THE ABOVE LOAD DETAIL DEPICTS THE USE OF THE NAVY-DEVELOPED IRSKIT FOR RESTRAINING A 15-PALLET UNIT LOAD IN A COMMERCIAL CONTAINER. F. RISSKIT INSTALLATION AND CONTAINER LOADING GUIDANCE, SEE NAVSEA DRAWING NWHC 7712 AND "CONTAINER PREPARATION AND LOADING PROCEDURES" AT RIGHT.
- TO PRECLUDE ANY INTERFERENCE BETWEEN IRSKIT COMPONENTS AND WOODEN DUNNAGE ASSEMBLIES, THE WOODEN DUNNAGE ASSEMBLIES MUST BE MODIFIED AS SHOWN IN THE DETAILS ON PAGES 4 AND 8 AND SPECIFIED IN THE SPECIAL NOTES ON PAGES 5 AND 8.
- 3. WHEN USING THE IRSKIT TO RESTRAIN THE 15-PALLET UNIT LOAD DEPICTED ON PAGE 2, PIECES MARKED (4) THRU (12) ARE TO BE OMITTED.

- INSTALL ONE SIDE FILL ASSEMBLY.
- 5. INSTALL TWO PALLET UNITS, TWO HIGH, AGAINST THE SIDE FILL ASSEMBLY.
- 6. REPEAT STEP 4.
- 7. REPEAT STEP 5. SEE GENERAL NOTE "L" ON PAGE 3.
- 8. REPEAT STEP 5.
- 9. REPEAT STEP 7.
- 10. REPEAT STEP 4.
- 11. REPEAT STEP 5.
- 12. REPEAT STEP 4.
- 13. REPEAT STEP 5.
- 14. INSTALL ONE PALLET UNIT, ONE HIGH, AGAINST THE SIDE FILL ASSEMBLY.
- 15. KEPEAT STEP 14. SEE GENERAL NOTE "L" ON PAGE 3.
- INSTALL ONE FILLER ASSEMBLY AGAINST THE SIDE FILL ASSEMBLY. 17. REPEAT STEP 16.
- 18. INSTALL ONE PALLET UNIT BETWEEN THE TWO FILLER ASSEMBLIES.
- 19. INSTALL REAR BLOCKING ASSEMBLY.
- 20. INSTALL THE ANGLES, ONE RIGHT HAND AND ONE LEFT HAND. MOVE THE ANGLES TOWARD THE REAR BLOCKING ASSEMBLY, AND AT THE SAME TIME INSERT THE THREADED ROD ASSEMBLIES THRU THE TOP AND BOTTOM HOLES OF THE ANGLE. INSTALL SPHERICAL WASHERS ON THE TOP THREADED RODS AND FLAT WASHERS ON THE BOTTOM THREADED RODS. INSTALL TIGHTENING NUT AND TIGHTEN. INSTALL JAM NUT. THE TIGHTENING NUT SHOULD BE TENSIONED UNTIL ALL SLACK IS REMOVED FROM THE LADING AND THE CABLES.

