APPROVED BY BUREAU OF EXPLOSIVES

DATE 6-29-95

# TOW

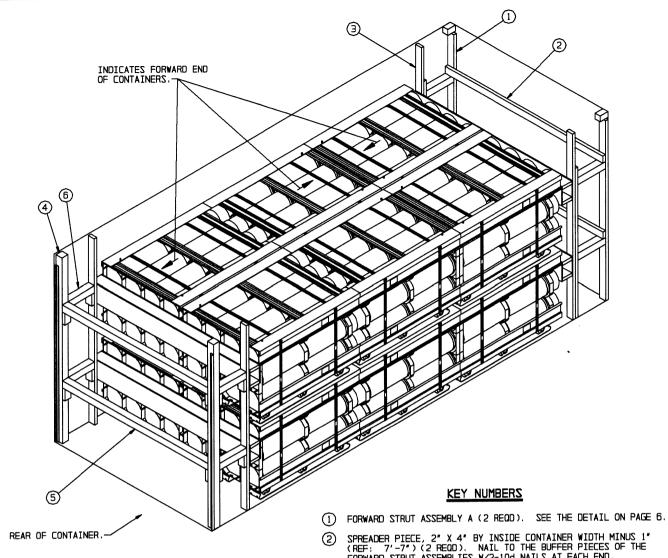
# LOADING AND BRACING WITH WOODEN DUNNAGE IN END OPENING ISO CONTAINERS OF GUIDED MISSILES PACKED ONE PER CNU-553/E CYLINDRICAL METAL CONTAINER

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LOADING AND BRACING SPECIFICATIONS SET FORTH WITHIN THIS DRAWING ARE APPLICABLE TO LOADS THAT ARE TO BE SHIPPED BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC) RAIL CARRIER SERVICE. THESE SPECIFICATIONS MAY ALSO BE USED FOR LOADS THAT ARE TO BE MOVED BY MOTOR OR WATER CARRIERS.

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#### ISOMETRIC VIEW

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" X 4" 2" X 6" 4" X 4"	81 61 41	54 61 55	
NAILS	NO. REQD	POUNDS	
6d (2") 10d (3") 12d (3-1/4")	176 76 40	1-1/4 1-1/2 3/4	
PLYWOOD, 1/2" 48.03 SQ FT REQD 66.04 LBS			

SPREADER PIECE, 2" X 4" BY INSIDE CONTAINER WIDTH MINUS 1" (REF: 7'-7")(2 REOD). NAIL TO THE BUFFER PIECES OF THE FORWARD STRUT ASSEMBLIES W/2-10d NAILS AT EACH END.

- FORWARD/REAR BLOCKING ASSEMBLY A (2 REOD). SEE THE DETAIL PAGE 6. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL PIECES THE FORWARD STRUT ASSEMBLIES W/6-10d NAILS. NOTE: STRUT LEDGERS ARE ONLY REQUIRED ON THE REAR BLOCKING ASSEMBLY. DO NOT INSTALL STRUT LEDGERS ON THE FORWARD SEE THE DETAIL ON 3 BLOCKING ASSEMBLY.
- DOOR POST VERTICAL A (2 REOD). SEE THE DETAIL ON PAGE 6, AND "DETAIL A" AND "DETAIL B" ON PAGE 9.
- DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8") (2 REOD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 8.
- STRUT, 4" X 4" BY CUT-TO-FIT (REF: 14-1/2") (4 REQD).
  TOENAIL TO THE BUFFER PIECE OF THE REAR BLOCKING ASSEMBLY AND
  THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE
  "BEVEL-CUT" DETAIL ON PAGE 8.

# **LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE	12	410 LBS

TOTAL WEIGHT - - - - - - 23,614 LBS (APPROX)

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12 PALLET UNIT LOAD

#### (GENERAL NOTES CONTINUED)

#### L. MAXIMUM LOAD WEIGHT CRITERIA:

THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT THE MAXIMUM LOAD WEIGHTS ARE CONTROLLED BY EQUIPMENT CAPABILITY FACTORS. ALTHOUGH THE HEAVIEST MAXIMUM LOADS ARE DELINEATED IN THE LOAD VIEWS, PROVISIONS ARE INCLUDED WITHIN THIS DRAWING SO THAT THE BASIC LOADS CAN BE ADJUSTED TO SATISFY A LESSER QUANTITY OF LADING UNITS. DEPENDING ON TRANSPORTATION ROUTING, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY "WEIGHT LAWS" OF CERTAIN STATES. ALSO, IT MAY BE NECESSARY TO REDUCE THE LOAD WEIGHT TO SATISFY "URIGHT LOAD WEIGHT TO SATISFY OTHER WEIGHT RESTRICTIONS IMPOSED ON THE INTERMODAL CONTAINER SYSTEM.

- REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLATCAR (T/COFC). SPECIAL T/COFC NOTES
  - A LOADED CONTAINER MUST BE ON A CHASSIS EQUIPPED WITH TWO BOGIE ASSEMBLIES WHEN BEING MOVED IN TOFC
  - THE LOAD LIMIT OF A T/COFC RAILCAR 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.
- N. DURING INTRASTATE AND/OR INTERSTATE MOVES BY MOTOR CARRIER, A PROPER CHASSIS OR MODIFIED FLATBED TRAILER MUST BE USED TO PRECLUDE VIOLATION OF ONE OR MORE "WEIGHT LAWS" APPLICABLE TO THE STATE OR STATES INVOLVED
- CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4 MM AND ONE POUND EQUALS 0.454 KG.
- OTHER TYPES OF LADING ITEMS MAY BE LOADED IN END OPENING COMPATIBLE, EXISTING TIEMS MAY BE LOADED IN END OPENING CONTAINERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED TIEM, PROVIDING THAT THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED.
- TO MAKE LOADING EASIER, TO HELP ACHIEVE A TIGHT LOAD ACROSS A CONTAINER, AND TO PREVENT UNACCEPTABLE DAMAGE TO LADING UNITS WHEN LOADING AN END OPENING 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 CONTAINERS 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 END OPENING 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
- R. THE QUANTITY OF PALLET UNITS SHOWN IN THE LOADS ON PAGES 2 AND 4 MAY BE REDUCED FOR SHIPMENT, IF DESIRED. SEE THE "LESS-THAN-FULL-LOAD" DETAILS ON PAGE 11. WHEN A CONTAINER IS TO BE LOADED WITH A REDUCED QUANTITY OF LADING UNITS, THE LENGTHWISE CENTER OF GRAVITY OF THE LOAD MUST BE WITHIN 12", IN EITHER DIRECTION, OF THE WIDE OF THE CONTAINER. MID-POINT OF THE CONTAINER
- THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CNU-553/E CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM OTHER THAN THE SPECIFIED GUIDED MISSILE, OR WHEN THEY ARE EMPTY.
- ANTI-CHAFING MATERIAL MAY BE INSTALLED AT POINTS OF CONTACT BETWEEN PALLET UNITS, AND BETWEEN PALLET UNITS AND THE CONTAINER, IF DESIRED, TO PREVENT CHAFING DAMAGE TO PAINT AND MARKINGS.

#### 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. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE
  APPLICABLE TO THE TOW GUIDED MISSILE PACKED ONE PER
  CNU-553/E CYLINDRICAL METAL CONTAINER. SUBSEQUENT
  REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH
  MISSILE COMPONENTS. CAUTION: REGARDLESS OF THE
  QUANTITY OF UNITS TO BE SHIPPED, THE "MAXIMUM GROSS
  WEIGHT" OF THE END OPENING ISO CONTAINER MUST NOT BE EXCEEDED.
- FOR DETAIL OF THE PALLET UNIT, SEE U.S. ARMY MATERIEL COMMAND DRAWING NO. 19-48-5268-GM20T02 AND PAGE 3.

PALLET DIMENSIONS - - - - 45-1/2" LONG X 58-15/16" \| \text{VIDE} \| X 38-7/16" \| \text{HIGH (APPROX)} \| GROSS WEIGHT - - - - - 1,542 POUNDS (APPROX)
CUBE - - - - - - - - 59.7 CUBIC FEET (APPROX)

- D. THE LOADS AS SHOWN ARE BASED ON A 4,700 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH END OPENING ISO CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 95" HIGH (93" CLEAR HEIGHT) AND A MAXIMUM GROSS WEIGHT OF 52,910 POUNDS. THE LOADS ARE DESIGNED FOR TRAILER/CONTAINER-ON-FLATCAR (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 CONTAINERS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD (TIGHT AGAINST THE DUNNAGE ASSEMBLIES). THE UNBLOCKED SPACE ACROSS THE WIDTH OF A LOAD BAY IS NOT TO EXCEED 1-1/2". EXCESSIVE SLACK CAN BE ELIMINATED BY LAMINATING ADDITIONAL PIECES OF APPROPRIATE THICKNESS TO THE LONGITUDINAL PIECES ON THE CRIB FILL ASSEMBLIES. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL PIECE W/1 APPROPRIATELY SIZED NAIL EVERY 12". ADDITIONALLY, THE LENGTH OF THE LATERAL PIECES IN THE CRIB FILL ASSEMBLY MAY BE ADJUSTED, AS NECESSARY, TO FACILITATE VARIANCE IN THE PALLET UNIT SIZE.
- F. DUNNAGE LUMBER SPECIFIED IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- A STAGGERED NAILING PATTERN WILL BE USED WHENEVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES OR WHEN LAMINATING DUNNAGE. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED TO THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED TO 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 THERE IS A SLOT AT THE CORNERS OF THE FORWARD WALL. PIECES OF DUNNAGE MATERIAL MUST BE LAMINATED TO THE BUFFER PIECES ON THE FORWARD STRUT ASSEMBLIES TO PROVIDE A FLAT SURFACE FOR THE 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 CORNER PORTIONS OF THE CONTAINER FORWARD WALL ARE SMOOTH AND FLAT.
- K. PORTIONS OF THE CONTAINER DEPICTED WITHIN THIS DRAWING, SUCH AS THE SIDEWALL, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

(CONTINUED AT LEFT)

#### MATERIAL SPECIFICATIONS

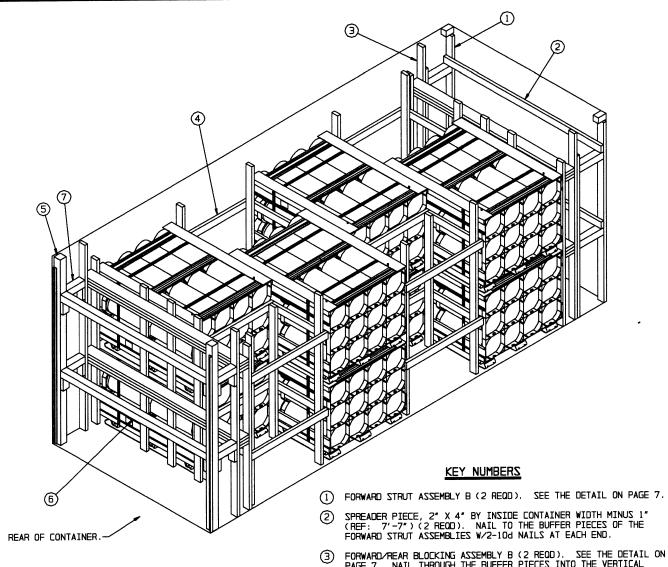
SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751. LUMBER - - - - - -:

NAILS - - - - - - : FED SPEC FF-N-105; COMMON.

PLYWOOD - - - - - - - COMMERCIAL ITEM DESCRIPTION
A-A-55057, TYPE A, 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.

ANTI-CHAFING MATERIAL - - - - -: MIL-B-121 (OR EQUAL); NEUTRAL BARRIER MATERIAL.

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#### ISOMETRIC VIEW

9	PAGE 7. NAIL THROUGH THE BUFFER PIECES INTO THE VERTICAL	
	PIECES THE FORWARD STRUT ASSEMBLIES W/6-10d NAILS. NOTE:	

STRUT LEDGERS ARE ONLY REQUIRED ON THE REAR BLOCKING ASSEMBLY. DO NOT INSTALL STRUT LEDGERS ON THE FORWARD BLOCKING ASSEMBLY.

(4) CRIB FILL ASSEMBLY (4 REOD). SEE THE DETAIL ON PAGE 8.

(5) DOOR POST VERTICAL B (2 REQD). SEE THE DETAIL ON PAGE 7, AND "DETAIL A" AND "DETAIL B" ON PAGE 9.

(6) DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT (REF: 7'-1-3/8') (2 REOD). TOENAIL TO THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE "BEVEL-CUT" DETAIL ON PAGE 8.

(7) STRUT, 4" X 4" BY CUT-TO-FIT (REF: 11-1/4") (4 REQD).
TOENAIL TO THE BUFFER PIECE OF THE REAR BLOCKING ASSEMBLY AND
THE DOOR POST VERTICAL W/2-12d NAILS AT EACH END. SEE THE
"BEVEL-CUT" DETAIL ON PAGE 8.

#### BILL OF MATERIAL LUMBER LINEAR FEET BOARD FEET 359 240 2" X 4" 2" X 6" 52 NAILS NO. REQD POUNDS 10d (3") 12d (3-1/4") 4-1/2 284 40 3/4

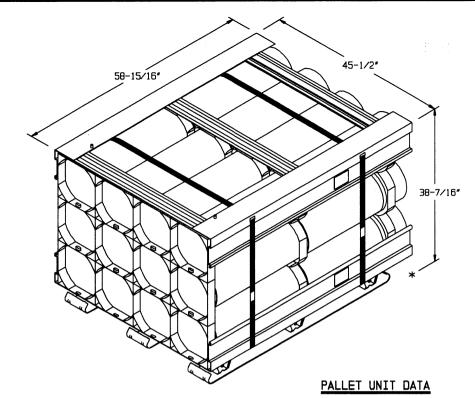
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ITEM	QUANTITY	WEIGHT (APPROX)
DUNNAGE		772 LBS

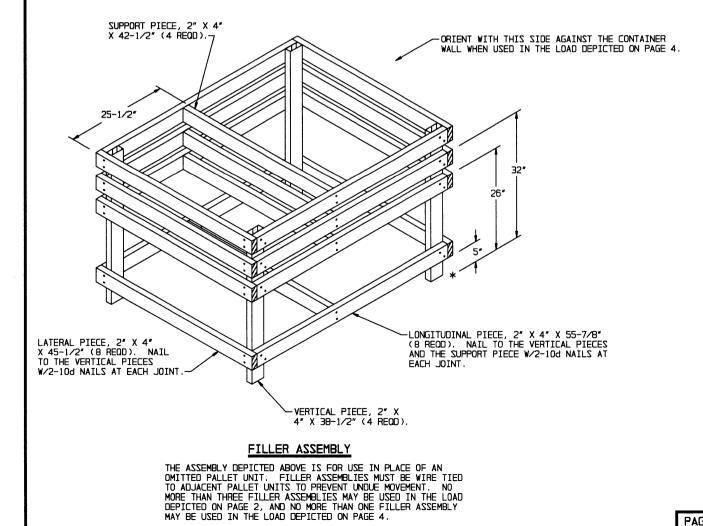
TOTAL WEIGHT - - - - - - 17,808 LBS (APPROX)

PAGE 4

EIGHT PALLET UNIT LOAD

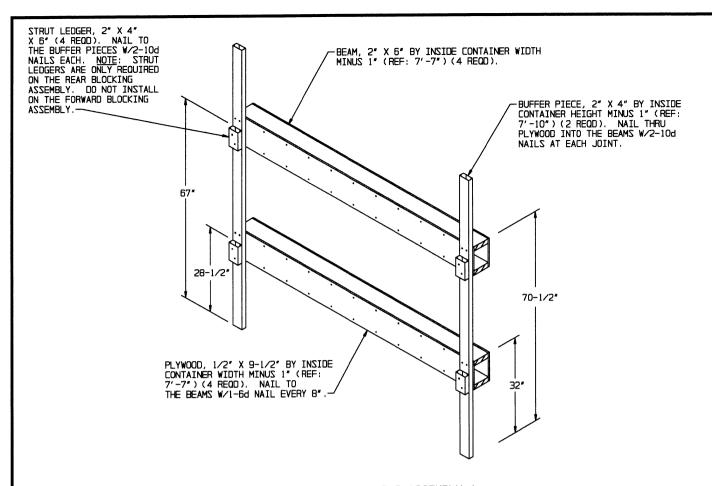


GROSS WEIGHT - - - - - - - - - 1,542 LBS (APPROX) CUBE - - - - - - - - - - - - 59.7 CUBIC FEET (APPROX)



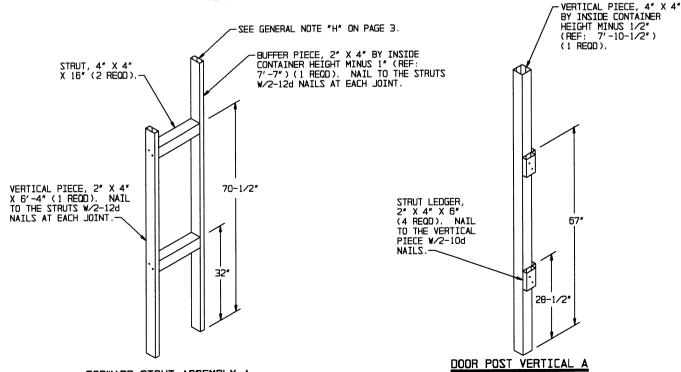
# PROJECT GM 876-93

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# FORWARD/REAR BLOCKING ASSEMBLY A

NOTE: FOR A ONE HIGH LOAD, ELIMINATE THE TOP BOX BEAM ASSEMBLY, AND REPLACE THE STRUT LEDGERS WITH TWO 2-1/2" LONG STRUT LEDGERS LOCATED AT 28-1/2", AS APPROPRIATE.

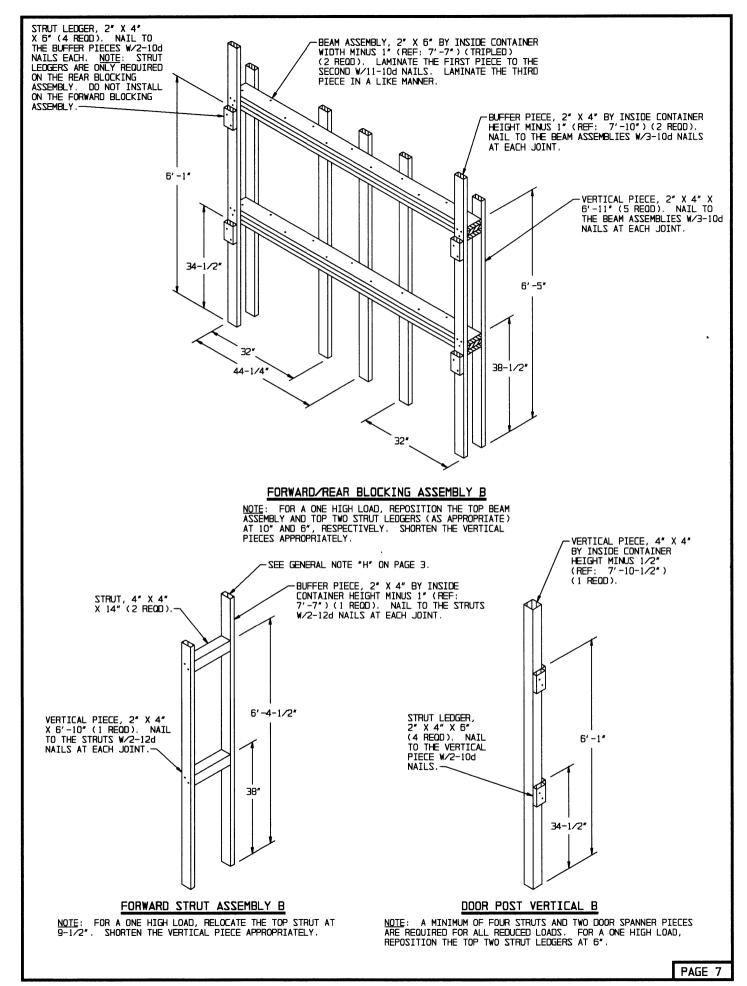


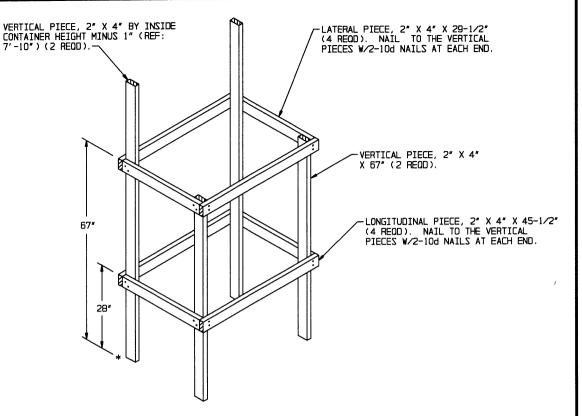
#### FORWARD STRUT ASSEMBLY A

NOTE: FOR A ONE HIGH LOAD, RELOCATE THE TOP STRUT AT 26°. SHORTEN THE VERTICAL PIECE APPROPRIATELY.

NOTE: A MINIMUM OF FOUR STRUTS AND TWO DOOR SPANNER PIECES ARE REQUIRED FOR ALL REDUCED LOADS. FOR A ONE HIGH LOAD, INSTALL TWO STRUT LEDGERS, 2-1/2" IN LENGTH, AT 28-1/2", AND INSTALL THE STRUTS AND DOOR SPANNERS ABOVE AND BELOW THE STRUT LEDGER.

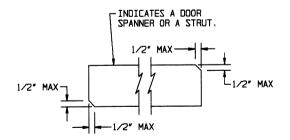
PAGE 6





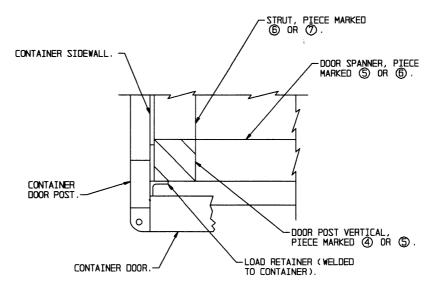
#### CRIB FILL ASSEMBLY

NOTE: FOR A ONE HIGH LOAD, REPOSITION THE TOP TWO LONGITUDINAL PIECES AND THE TOP TWO LATERAL PIECES AT 38", AND REPOSITION THE LOWER TWO LONGITUDINAL PIECES AND THE LOWER TWO LATERAL PIECES AT 18". SHORTEN THE 67" VERTICAL PIECES APPROPRIATELY. THE LENGTH OF THE LATERAL PIECES IS DEPENDENT ON THE VOID BETWEEN THE PALLET UNIT AND THE CONTAINER SIDEWALL.



#### BEVEL-CUT

IF DESIRED, EACH END OF A DOOR SPANNER PIECE OR A STRUT MAY BE BEVEL-CUT AS SHOWN ABOVE TO FACILITATE THE ACHIEVEMENT OF A TIGHT DOOR-POST-TO-DOOR-POST OR REAR-BLOCKING-ASSEMBLY-TO-DOOR-POST FIT.

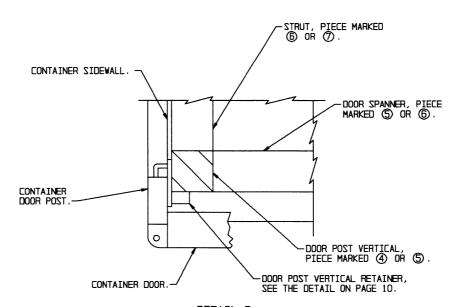


#### **DETAIL A**

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.

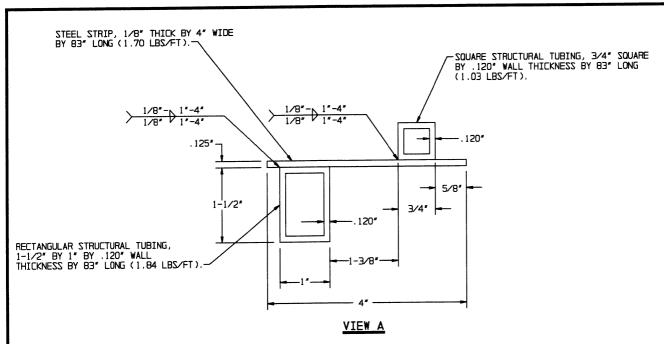
#### SPECIAL NOTE:

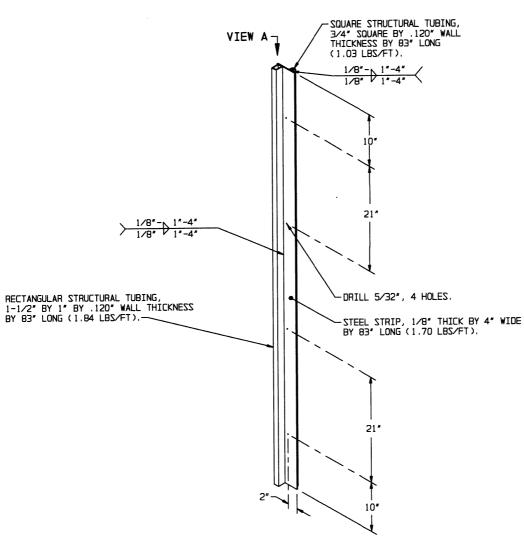
WHEN ISO CONTAINERS ARE NOT EQUIPPED WITH PRE-WELDED LOAD RETAINERS, AS DEPICTED IN "DETAIL A" ABOVE, DOOR POST VERTICAL RETAINERS WILL BE REQUIRED FOR THE LOADS DEPICTED ON PAGES 2 AND 4. SEE VARIOUS LOADS WITHIN AMC DRAWING 19-48-4153-15PA1002 FOR EXAMPLES. SEE PAGE 10 FOR DETAILS OF THE METAL DOOR POST VERTICAL RETAINER.



# DETAIL B

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





# DOOR POST VERTICAL RETAINER

 $\underline{\text{NOTE}}\colon$  THE ABOVE ASSEMBLY HAS BEEN SHOWN ROTATED 90° FROM THE ORIENTATION IN WHICH IT IS INSTALLED IN THE LEFT REAR CORNER OF THE CONTAINER. THE ASSEMBLY HAS BEEN ROTATED FOR HOLE LOCATION CLARITY.

