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DATE <i>7/27/77</i>	DATE <i>7/12/77</i>

# INTERIM PROCEDURES

## LOADING AND BRACING WITH WOODEN DUNNAGE IN COMMERCIAL CONTAINERS OF SKIDDED UNITS OF 105MM BOXED AMMUNITION (LARGE BOX)(MIXED LOAD OF 15-BOX AND 9-BOX SKIDDED UNITS)

THE INTERIM LOADING AND BRACING PROCEDURES SPECIFIED BY THIS DRAWING ARE ONLY APPLICABLE FOR USE ONE TIME, UNLESS OTHERWISE DIRECTED, IN SUPPORT OF A TRIAL SHIPMENT PROGRAM. APPROVAL OF THIS DRAWING, AS REFLECTED HEREON, IS BASED ON THE CONSTRAINTS SET FORTH IMMEDIATELY ABOVE.

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'-6" HIGH CONTAINER, 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).

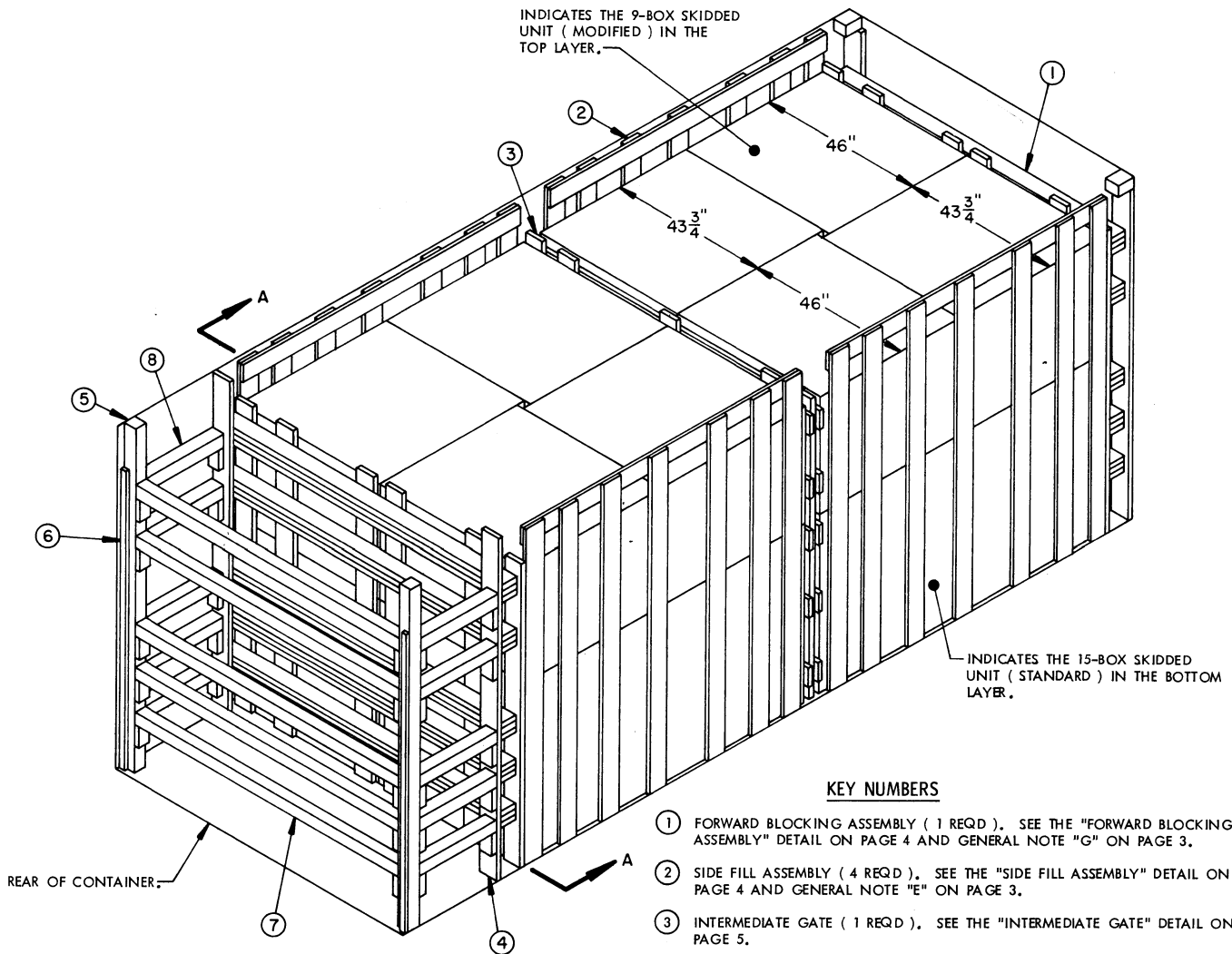
REQUIREMENTS CITED WITHIN THE BUREAU OF EXPLOSIVES PAMPHLET 6C APPLY WHEN THE SHIPMENT MOVES BY TRAILER/CONTAINER-ON-FLAT-CAR (T/COFC). SPECIAL T/COFC NOTES FOLLOW.

- 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.

REVISIONS				DESIGNER <i>Roc Ave</i>	PROJ ENG <i>GWP/NEW</i>
				CHECKER <i>WJL</i>	LOG ENGRG OFFICE <i>WJL</i>
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				DATE: AUGUST 1977	
				DARCOM AMMO CEN DWG NO.	
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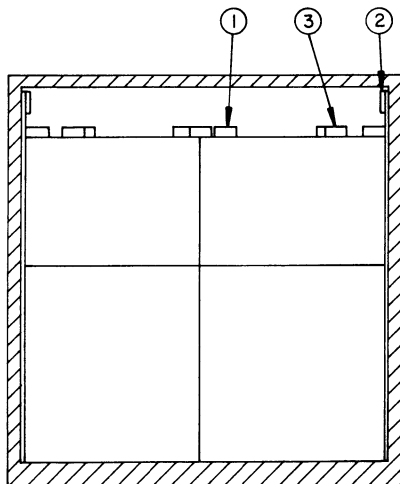
**DO NOT SCALE**



ISOMETRIC VIEW

KEY NUMBERS

- ① FORWARD BLOCKING ASSEMBLY ( 1 REQD ). SEE THE "FORWARD BLOCKING ASSEMBLY" DETAIL ON PAGE 4 AND GENERAL NOTE "G" ON PAGE 3.
- ② SIDE FILL ASSEMBLY ( 4 REQD ). SEE THE "SIDE FILL ASSEMBLY" DETAIL ON PAGE 4 AND GENERAL NOTE "E" ON PAGE 3.
- ③ INTERMEDIATE GATE ( 1 REQD ). SEE THE "INTERMEDIATE GATE" DETAIL ON PAGE 5.
- ④ REAR BLOCKING ASSEMBLY ( 1 REQD ). SEE THE "REAR BLOCKING ASSEMBLY" DETAIL ON PAGE 6.
- ⑤ DOOR POST VERTICAL ( 2 REQD ). SEE THE "DOOR POST VERTICAL" DETAIL ON PAGE 5.
- ⑥ DOOR POST VERTICAL RETAINER ( 2 REQD ). SEE THE "DOOR POST VERTICAL RETAINER" DETAIL ON PAGE 7. NAIL THROUGH HOLES INTO DOOR POST VERTICAL W/4-10d NAILS.
- ⑦ DOOR SPANNER, 4" X 4" MATERIAL, CUT TO A LENGTH THAT WILL PROVIDE FOR A DRIVE FIT ( REF: 7'-1-3/8" ) ( 5 REQD ). TOENAIL TO THE DOOR POST VERTICALS W/2-12d NAILS AT EACH END. SEE THE "BEVEL CUT" DETAIL ON PAGE 8. AFTER INSTALLING THE BOTTOM AND THE TOP DOOR SPANNERS, THE STRUTS, PIECES MARKED ⑧, ARE TO BE INSTALLED.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT ( 10 REQD ). TOENAIL TO THE BUFFER PIECES 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.



SECTION A-A

( GENERAL NOTES CONTINUED )

GENERAL NOTES

9. REPEAT STEP 5.
10. INSTALL REAR BLOCKING ASSEMBLY.
11. INSTALL TWO DOOR POST VERTICALS WITH DOOR POST VERTICAL RETAINERS. SEE "DETAIL A" ON PAGE 8.
12. INSTALL TWO DOOR SPANNERS BETWEEN THE DOOR POST VERTICALS ( ONE AT THE LOWEST POSITION AND ONE AT THE UPPERMOST POSITION ).
13. INSTALL STRUTS BETWEEN THE REAR BLOCKING ASSEMBLY AND THE DOOR POST VERTICALS.
14. INSTALL REMAINING DOOR SPANNERS.

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 ( CHAPTER 5 ).
- B. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED TO SUPPORT A TRIAL SHIPMENT PROGRAM. THE DELINEATED OUTLOADING PROCEDURES SPECIFY A "WOODEN DUNNAGE" METHOD OF BLOCKING AMMUNITION IN COMMERCIAL INTERMODAL CONTAINERS.
- C. THE SPECIFIED OUTLOADING PROCEDURE IS APPLICABLE TO A MIXED LOAD OF 15-BOX AND 9-BOX SKIDDED UNITS OF 105MM COMPLETE ROUND WHEN PACKED 2 PER WOODEN BOX ( LARGE BOX ). SUBSEQUENT REFERENCE TO SKIDDED UNIT MEANS THE SKIDDED UNIT WITH AMMUNITION ITEMS. SEE PAGE 9 FOR DETAIL OF SKIDDED 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 4,020 POUND 20' LONG BY 8' WIDE BY 8'-6" HIGH INTERMODAL COMMERCIAL CONTAINER WITH INSIDE DIMENSIONS OF 19'-4" LONG BY 92" WIDE BY 95" HIGH. THE LOAD IS 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 CONFIGURATION DESIGN CAN BE USED.
- E. WHEN LOADING PALLET UNITS, THEY ARE TO BE POSITIONED SO AS TO ACHIEVE A TIGHT LOAD ( TIGHT AGAINST 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 VERTICAL PIECES ON A SIDE FILL ASSEMBLY. NAIL EACH ADDITIONAL PIECE TO THE VERTICAL 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 CORNER 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.
- M. RECOMMENDED SEQUENTIAL LOADING PROCEDURES:
  1. PREFABRICATE ONE FORWARD BLOCKING ASSEMBLY, FOUR SIDE FILL ASSEMBLIES, ONE INTERMEDIATE GATE, 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 GATE AND LOAD TWO SKIDDED UNITS, ONE 15-BOX UNIT AND ONE 9-BOX UNIT.
  4. REPEAT STEP 3.
  5. LOAD FOUR SKIDDED UNITS, TWO 15-BOX UNITS AND TWO 9-BOX UNITS.
  6. INSTALL INTERMEDIATE GATE.
  7. REPEAT STEP 3.
  8. REPEAT STEP 3.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	249	125
2" X 4"	15	10
2" X 6"	452	452
4" X 4"	73	98
NAILS	NO. REQD	POUNDS
6d ( 2" )	84	1/2
10d ( 3" )	678	10-1/2
12d ( 3-1/4" )	60	1
DOOR POST VERTICAL RETAINER--- 2 REQD ----- 64 LBS		

**MATERIAL SPECIFICATIONS**

- LUMBER**-----: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS**-----: COMMON, CEMENT COATED OR CHEMICALLY ETCHED; FED SPEC FF-N-105.  
ALT: ANNULAR-RING TYPE NAIL OF THE SAME SIZE.
- STEEL, STRUCTURAL**:- SQUARE STRUCTURAL TUBING, AND ROLLED PLATE: FED SPEC QQ-5-741.

( CONTINUED AT LEFT )

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT ( APPROX )
15-BOX UNIT	8	18,000 LBS
9-BOX UNIT	8	10,928 LBS
DUNNAGE		1,446 LBS
CONTAINER		4,020 LBS
TOTAL GROSS WEIGHT		34,394 LBS

LOAD BEARING PIECE, 2" X 6" X 7'-0" ( 6 REQD ). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

BEAM ASSEMBLY, 2" X 6" X 7'-6" ( TRIPLED ) ( 5 REQD ). LAMINATE THE SECOND PIECE TO THE FIRST PIECE W/11-10d NAILS. LAMINATE THE THIRD PIECE TO THE SECOND PIECE IN A LIKE MANNER.

BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" ( REF: 7'-7-1/2" ) ( 2 REQD ). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 1 ON PAGE 5.

**FORWARD BLOCKING ASSEMBLY**  
( 1 REQD )

SEE GENERAL NOTE "H" ON PAGE 3.

TIE PIECE, 1" X 6" X 7'-4" ( 1 REQD ). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH JOINT. CLINCH AS REQUIRED.

VERTICAL PIECE, 1" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" ( REF: 7'-10" ) ( 7 REQD ).

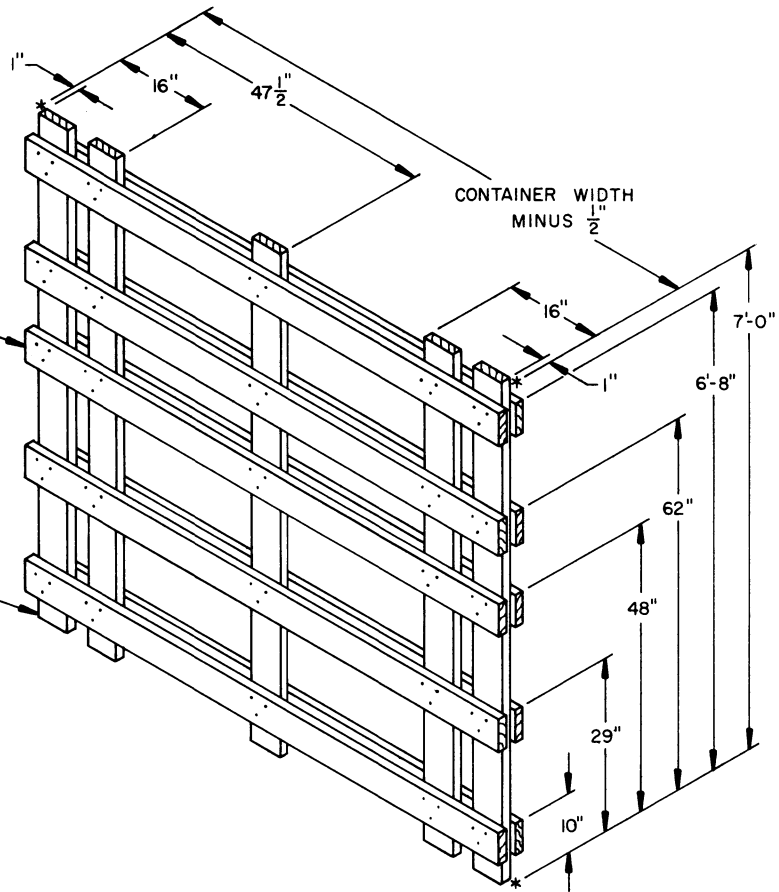
**SIDE FILL ASSEMBLY**  
( 4 REQD )

LATERAL PIECE, 2" X 6" BY CONTAINER WIDTH MINUS 1/2" ( 10 REQD ). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 7'-0" ( 5 REQD ).

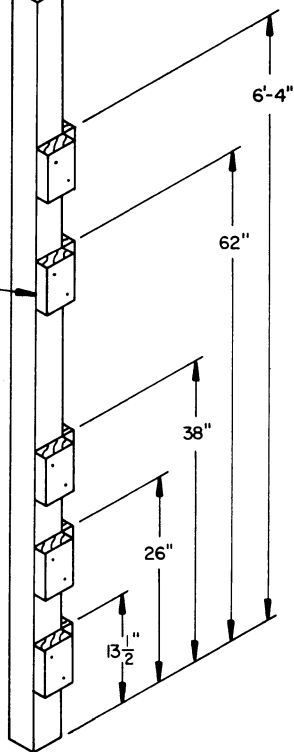
DOOR POST VERTICAL, 4" X 4" BY CUT TO FIT ( 1 REQD ).

STRUT LEDGER, 2" X 4" X 6" ( 10 REQD ). NAIL TO THE DOOR POST VERTICAL W/2-10d NAILS. SEE SPECIAL NOTE 2 AT RIGHT.



**INTERMEDIATE GATE**  
( 1 REQD )

**DOOR POST VERTICAL**  
( 2 REQD )



**SPECIAL NOTES:**

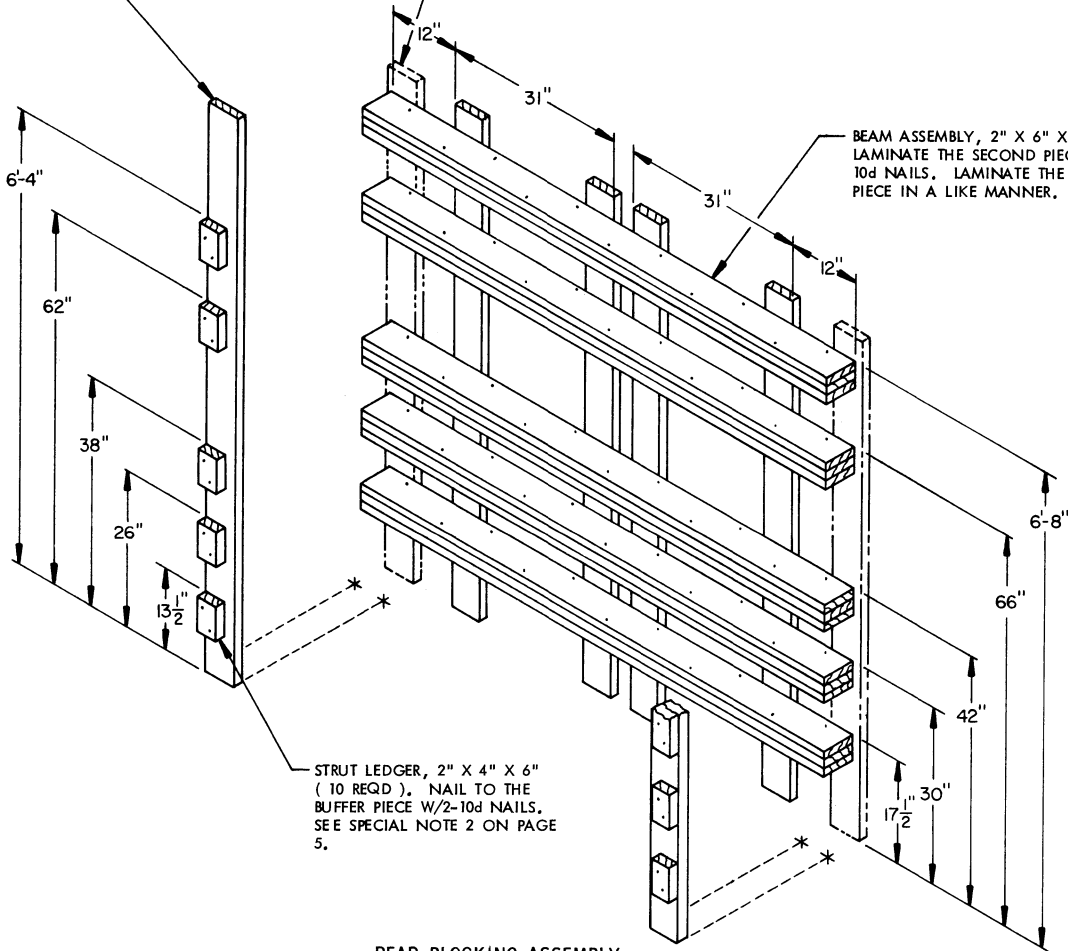
1. THE TWO OUTSIDE 7'-0" LOAD BEARING PIECES AND THE TWO BUFFER PIECES OF THE FORWARD AND REAR BLOCKING ASSEMBLIES ARE NOT TO BE NAILED INTO PLACE UNTIL THE SUB-ASSEMBLIES MADE UP FROM THE OTHER PIECES HAVE BEEN MOVED INTO THE CONTAINER. LAY THE FORWARD BLOCKING SUB-ASSEMBLY ON THE FLOOR OF THE CONTAINER WITH THE BEAMS RUNNING CROSS-WISE AND THE LOAD-SIDE OF THE BEARING PIECES ON THE FLOOR. SLIDE THE SUB-ASSEMBLY FORWARD UNTIL THE BASE END OF THE BEARING PIECES CONTACT THE FRONT WALL, AND POSITION IT Laterally UNTIL THE ENDS OF THE BEAMS ARE AT EQUAL DISTANCE ( APPROX 1" ) FROM THE SIDE WALLS OF THE CONTAINER. PLACE THE FORWARD BUFFER PIECES ON THE SUB-ASSEMBLY WITH THE OUTSIDE EDGE OF EACH PIECE ALMOST IN CONTACT WITH THE ADJACENT SIDE WALL OF THE CONTAINER. NAIL EACH PIECE AS SPECIFIED. RAISE THE ASSEMBLY AND POSITION IT AGAINST THE FORWARD WALL OF THE CONTAINER. PLACE THE TWO 7'-0" LONG LOAD BEARING PIECES SO THAT THE OUTER EDGE OF EACH PIECE IS IN CONTACT WITH THE ADJACENT SIDE WALL OF THE CONTAINER. NAIL EACH PIECE AS SPECIFIED.  
NOTE THAT THE REAR BLOCKING SUB-ASSEMBLY CANNOT BE PLACED ON THE FLOOR OF THE CONTAINER WHILE INSTALLING THE 7'-0" LONG LOAD BEARING PIECES. IN LIEU THEREOF, THE SUB-ASSEMBLY WILL BE PLACED UPRIGHT JUST INSIDE THE DOOR OPENING. NAIL EACH LOAD BEARING PIECE AS SPECIFIED. AFTER SUB-ASSEMBLY IS PLACED AGAINST THE LADING, NAIL THE BUFFER PIECES AS SPECIFIED.
2. THE STRUT LEDGERS CAN ONLY BE PRE-NAILED TO THE DOOR POST VERTICAL ON ONE SIDE OF THE CONTAINER FOR THE DOOR SPANNER PIECES. ALSO, THE STRUT LEDGERS FOR THE STRUTS CAN ONLY BE PRE-NAILED TO THE REAR BLOCKING ASSEMBLY OR THE DOOR POST VERTICAL, EXCEPT AT THE LOWEST DIMENSION.

BUFFER PIECE, 2" X 6" BY INSIDE CONTAINER HEIGHT MINUS 1/2" ( REF: 7'-10" ) ( 2 REQD ). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT.

LOAD BEARING PIECE, 2" X 6" X 7'-0" ( 6 REQD ). NAIL TO THE BEAM ASSEMBLIES W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 1 ON PAGE 5.

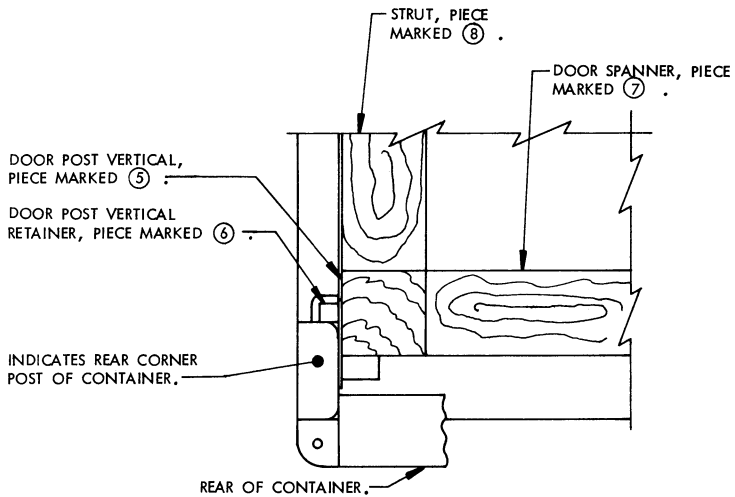
BEAM ASSEMBLY, 2" X 6" X 7'-6" ( TRIPLED ) ( 5 REQD ). LAMINATE THE SECOND PIECE TO THE FIRST PIECE W/11-10d NAILS. LAMINATE THE THIRD PIECE TO THE SECOND PIECE IN A LIKE MANNER.

STRUT LEDGER, 2" X 4" X 6" ( 10 REQD ), NAIL TO THE BUFFER PIECE W/2-10d NAILS. SEE SPECIAL NOTE 2 ON PAGE 5.



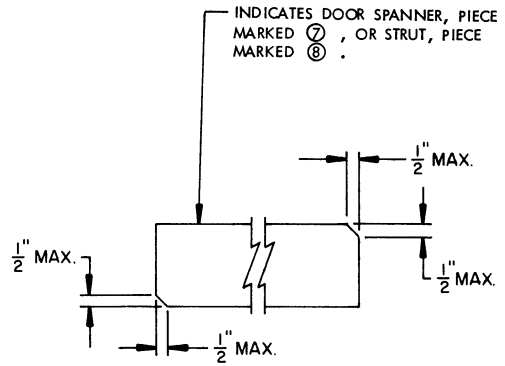
**REAR BLOCKING ASSEMBLY**  
( 1 REQD )





**DETAIL A**

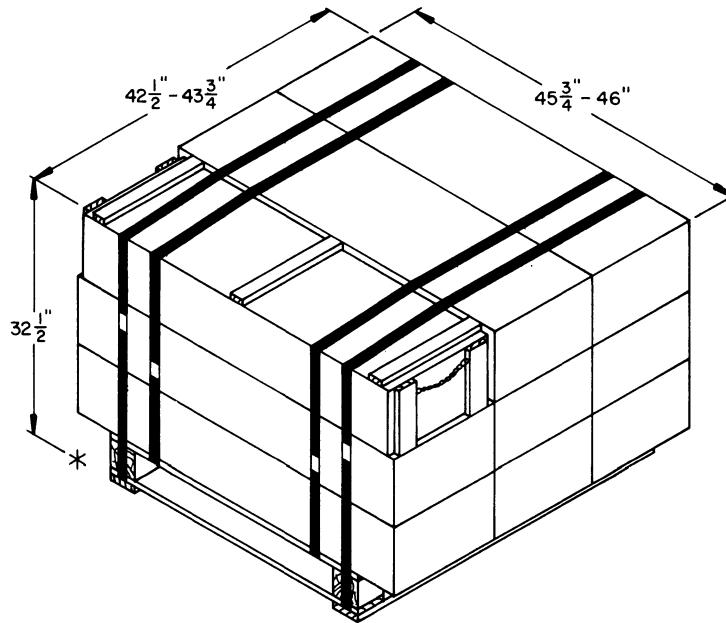
A PARTIAL PLAN VIEW OF THE LEFT REAR PORTION OF THE CONTAINER IS SHOWN DEPICTING THE PROPER POSITION OF THE DOOR POST VERTICAL AND ADJACENT DUNNAGE PIECES.



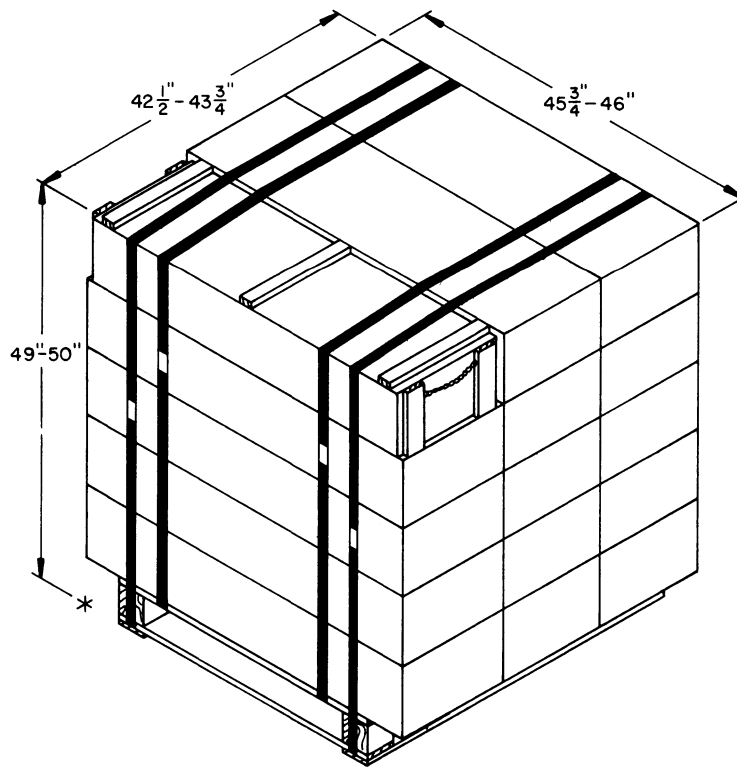
**BEVEL-CUT**

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





**SKIDDED UNIT ( MODIFIED )**  
 UNIT WEIGHT----1,366 LBS ( APPROX )  
 CUBE-----37.9 CUBIC FEET



**SKIDDED UNIT ( STANDARD )**  
 UNIT WEIGHT----2,250 LBS ( APPROX )  
 CUBE -----58.2 CUBIC FEET

