# LOADING AND BRACING (TL & LTL) IN VAN TRAILERS OF CBU ITEMS PACKED IN CNU-147/E TWIN PACK CONTAINERS

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CAUTION: THE PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE FOR HIGHWAY MOVEMENTS; NOT FOR TRAILER-ON-FLATCAR MOVEMENTS.

U.S. ARMY MATERIEL COMMAND DRAWING					
APPROVED, U.S. ARMY ARMAME	ENT, MUNITIONS AND	DRAFT:	NAMZ	TECHNICIAN	ENGINEER
CHEMICAL COMMAND		B. LEO	NARD	P. BRIGHT	
Time beek	me				
APPROVED BY ORDER OF COMMA	NDING GENERAL, U.S.	VALIDAT BAGINEE DIVISI	RING	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
ARMY MATERIEL COMMAND		S	MI	V. Fresus	R WFEnst
William J Erns T U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL		Peel Tzugua			
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SEE THE REVISION L	ISTING ON PAGE 3	19	48	4082	11A1004

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## GENERAL NOTES

- THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- THE OUTLOADING PROCEDURES CONTAINED HEREIN ARE APPLICABLE TO CBU ITEMS WHEN THEY ARE PACKAGED IN THE CNU-147/E TWIN PACK CONTAINER. SUBSEQUENT REFERENCE SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE TWIN PACK CONTAINER WITH
- FOR DETAIL OF THE TWIN PACK CONTAINER SEE PAGE 3.
- THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT THE OUTLOADING PHOLEDORES DEPICTED WITHIN THIS DUCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE VAN TRAILERS, AND APPLY TO TRAILERS HAVING WOOD, OR WOOD AND METAL, OR ALL METAL FLOORS. VAN TRAILERS WHICH ARE 40'-0" TO 48'-0" LONG BY 7'-6' TO 8'-2" WIDE (INSIDE DIMENSION) HAVE BEEN SHOWN, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR TRAILERS WHICH ARE 89" THRU 99" IN WITHIN AND FOR TRAILERS OF OTHER LENGTHS ERROR THE ALSO APPLICABLE FOR TRAILERS WHICH ARE 89" THRU 99" IN WIDTH AND FOR TRAILERS OF OTHER LENGTHS FROM THE SHORTEST TO THE LONGEST AVAILABLE (REF: 24' TO 53'), AND FOR STRAIGHT TRUCK VANS. THE LOADING AND BRACING PROCEDURES SPECIFIED HEREIN ARE ALSO ADEQUATE (CONFIGURATION WISE AND STRENGTH WISE) FOR LOADS IN SHORTER OR LONGER VANS AND IN NARROWER OR WIDER VANS THAN SHOWN. THE SPECIFIED BRACING IS ADEQUATE FOR LOADS WEIGHING UP TO AND INCLUDING THE MAXIMUM WEIGHTS PERMITTED BY LAW. PERMITTED BY LAW.
- SELECTION OF A VEHICLE TO BE USED TO TRANSPORT THE DESIGNATED ITEM MUST COMPLY WITH AR 55-355, CHAPTER 29, FOR EXPLOSIVES AND OTHER DANGEROUS ARTICLES, IN FULL.
- THE GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A LOAD WILL BE THE RESPONSIBILITY OF THE CARRIER. THE CARRIER WILL ADVISE THE SHIPPER OF THE APPLICABLE LOADING REDUIREMENTS, AND THE SHIPPER WILL LOAD ACCORDINGLY. THE TOTAL WEIGHT OF THE LADING, OF THE DUNNAGE, OF THE TRACTOR, AND OF THE SEMITRAILER CARRYING THE LADING MUST NOT EXCEED THE MAXIMUM GROSS WEIGHT ALLOWED FOR THE STATE OR STATES THRU WHICH THE LOAD IS TO BE TRANSPORTED BY MOTOR CARRIER. LIKEWISE, THE GROSS WEIGHT ON A SINGLE OR TANDEM AXLE MUST NOT EXCEED THE MAXIMUM ALLOWABLE WEIGHT. IF THERE IS ANY DOUBT AS TO WHETHER THE TOTAL GROSS WEIGHT OR AXLE WEIGHT EXCEEDS THE MAXIMUM ALLOWED, WEIGHT SHOULD BE VERIFIED BY ACTUALLY WEIGHING THE LOADED VEHICLE.
- A SHIPMENT WILL BE POSITIONED IN THE TRAILER NOTILE: A SHIPMENI WILL BE POSTITUNED IN THE HAILER CONSISTENT WITH STATE WEIGHT LAWS. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED. COMBINATIONS OF THE OUTLOADING PROCEDURES SPECIFIED MAY BE USED. HOWEVER, THE APPROVED METHODS SHOWN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE DESIGNATED ITEMS.
- THE "LOAD AS SHOWN" FOR MOST OF THE FULL LOADS DEPICTED HEREIN IS BASED ON AN APPROXIMATE LADING WEIGHT OF 41,000 POUNDS. THE SPECIFIED BLOCKING AND BRACING FOR THE FULL LOADS IS ADEQUATE FOR THE RETENTION OF HEAVIER LOADS, IF IT IS DESIRED TO INCREASE THE LADING WEIGHT.

(CONTINUED AT RIGHT)

# MATERIAL SPECIFICATIONS

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

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

MAY BE SUBSTITUTED.

STRAPPING, STEEL - -: ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR

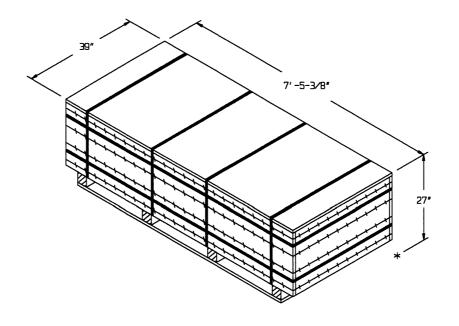
SEAL, STRAP ----: ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH

YPE, STYLE I, II, OR IV.

ASTM A853; ANNEALED AT FINISH, BLACK WIRE, CARBON STEEL -: DXIDE FINISH, .0800" DIA, GRADE 1006

#### (GENERAL NOTES CONTINUED)

- J. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEM, PROVIDING 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 EXISTED A SPECIAL DESIGNATION. CRITERIA SPECIFIED HEREIN.
- K. SOME LOADS ARE SHOWN IN TRAILERS HAVING ROUNDED CORNERS AT THE FORWARD END. IF THE CONVENTIONAL VAN TRAILER BEING USED IS EQUIPPED WITH A SQUARE FRONT OR WITH AN INSTALLED BULKHEAD, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND POSITION THE CONTAINERS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- L. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP
  JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES
  WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER
  IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER,
  WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL
  THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER
  TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 16 FOR GUIDANCE.
- M. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE.
- NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS. 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. N. NOTICE:
- O. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED TRAILER LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- P. <u>CAUTION</u>: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, CONTAINERS BEING LOADED INTO THE CONVEYANCE MUST BE POSITIONED TO ALLOW A CLEAR PATH OF EXIT FOR THE OPERATOR AT ALL TIMES, SHOULD AN EMERGENCY EXIT
- RECOME NECESSARY.
- Q. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED-HEADER METHOD OF REAR BLOCKING MUST BE INSTALLED. SEE THE "PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS" ON PAGE 17 FOR GUIDANCE. NOTE THAT THE NAILED-HEADER METHOD OF REAR BLOCKING MAY ALSO BE USED IN TRAILERS EQUIPPED WITH
- R. PORTIONS OF THE TRAILERS, SUCH AS SIDEWALLS, ENDWALLS, AND ROOFS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- S. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



# CONTAINER DETAIL

CONTAINER DIMENSIONS - - - - 7'-5-3/8" LONG X 39" WIDE X 27" HIGH. CONTAINER GROSS WEIGHT - - - 1,855 POUNDS MAXIMUM (APPROX)

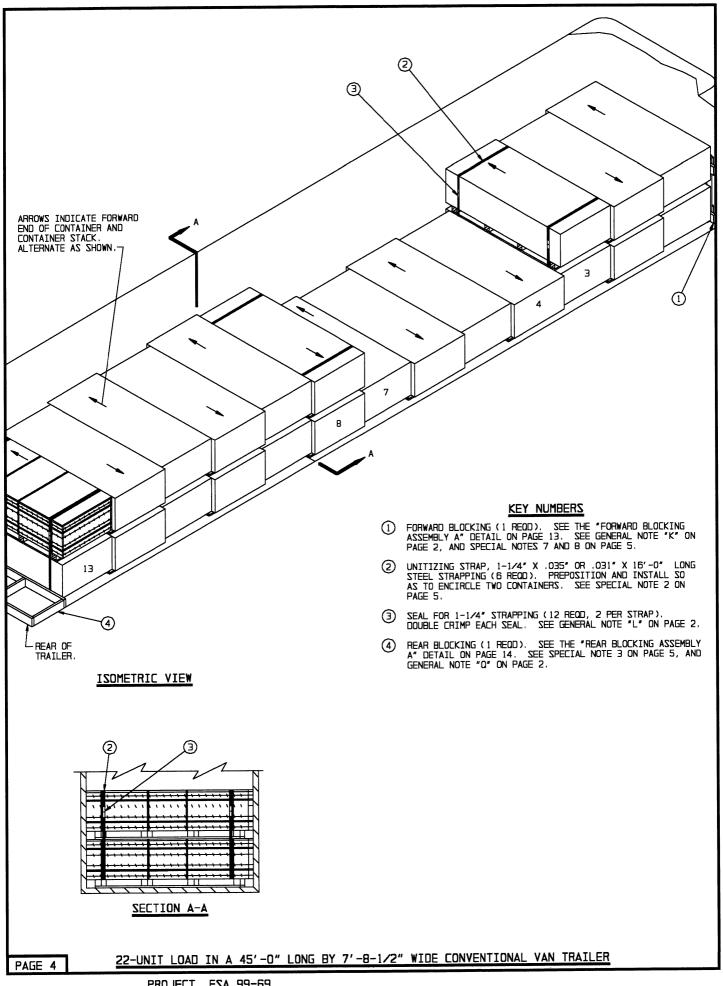
# REVISION

REVISION NO. 1, DATED JULY 1993, CONSISTS OF:

- 1. UPDATING GENERAL NOTES AND MATERIAL SPECIFICATIONS.
- 2. ADDING PROCEDURES FOR LONGER AND WIDER TRAILERS.
- 3. DELETING PROCEDURES FOR TRAILERS EQUIPPED WITH MECHANICAL BRACING.

CONTAINER DETAIL

PAGE 3



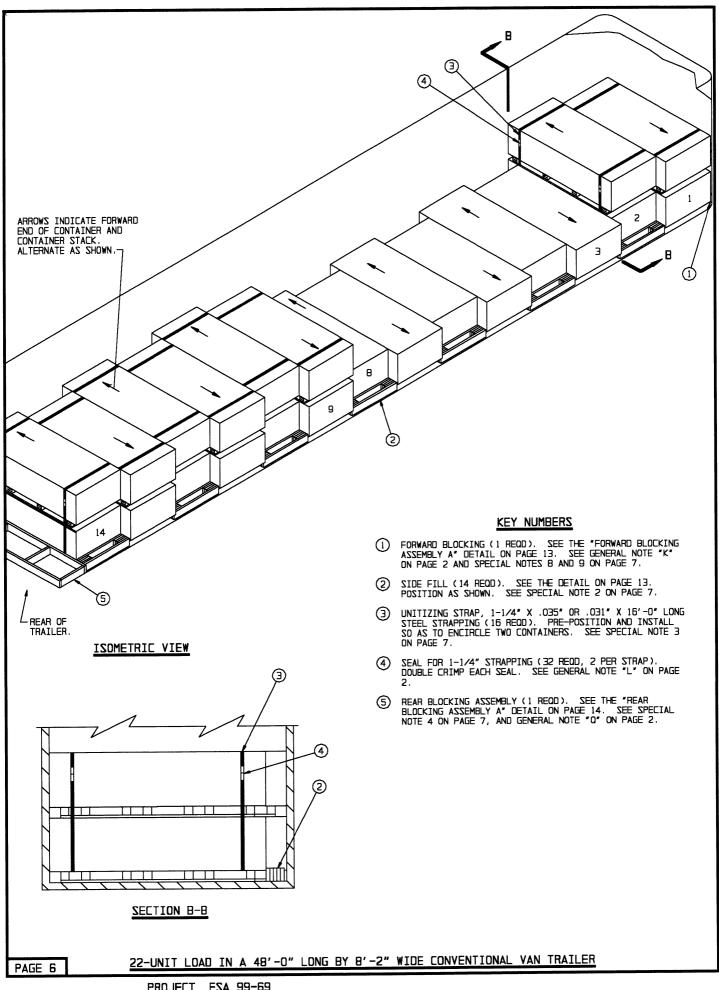
- A 22-UNIT LOAD IS SHOWN IN A 45"-0' LONG BY 7'-8-1/2" WIDE (INSIDE DIMENSION) CONVENTIONAL TYPE VAN TRAILER, TRAILERS OF OTHER DIMENSIONS CAN BE USED. IF THE TRAILER TO BE LOADED IS MORE THAN 7'-8-1/2" WIDE, REFER TO THE PROCEDURES DEPICTED ON PAGES 6 AND 7.
- 2. A CONTAINER AT EACH END OF THE SECOND LAYER PORTION OF THE LOAD MUST BE UNITIZED TO A CONTAINER IN THE FIRST LAYER, UNLESS THEY ARE POSITIONED AGAINST THE FORWARD WALL OF A SOUARE-FRONT TRAILER, AGAINST THE FORWARD BLOCKING ASSEMBLY, OR AGAINST AN INSTALLED BULKHEAD. THE UNITIZING STRAPS, PIECE MARKED ②, MUST BE INSTALLED PRIOR TO FINAL POSITIONING OF THE STACKED CONTAINERS.
- 3. IF THE SPACE AT THE REAR OF THE LOAD BETWEEN THE CONTAINERS AND THE REAR DOOR MEASURES 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE "REAR BLOCKING ASSEMBLY C" AS DETAILED ON PAGE 15. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR GREATER, USE "REAR BLOCKING ASSEMBLY A" AS SHOWN.
- THE LOAD QUANTITY MAY BE ADJUSTED TO COMPLY WITH THE MAXIMUM LOAD WEIGHT REQUIREMENT OR THE QUANTITY TO BE TRANSPORTED.
- FOR SHIPMENT OF LESS THAN FULL LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 10 THRU 12.
- 5. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED-HEADER METHOD OF REAR BLOCKING MUST BE INSTALLED. SEE THE "PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS" ON PAGE 17 FOR GUIDANCE. NOTE THAT THE NAILED-HEADER METHOD OF REAR BLOCKING MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
- 7. THE OUTLOADING PROCEDURES AS SHOWN ARE BASED ON THE 27"
  HIGH WIREBOUND, WRAP-AROUND CONTAINER. HOWEVER, THE
  PROCEDURES ARE ALSO APPLICABLE TO THE PLYWOOD TWIN PACK
  CONTAINERS WHICH ARE SLIGHTLY LESS IN HEIGHT
  (APPROXIMATELY 1-3/4"). FOR GUIDANCE PERTINENT TO
  OUTLOADING PROCEDURES FOR THE PLYWOOD TWIN PACK
  CONTAINERS, SEE SPECIAL NOTE 8 BELOW.
- 8. WHEN SHIPPING THE PLYWOOD TWIN PACK CONTAINER, THE HEIGHT DIMENSIONS FOR THE HORIZONTAL PIECES OF THE FORWARD BLOCKING MUST BE CHANGED TO 9", 35", AND 38" FROM BOTTOM TO TOP.
- 9. IF DESIRED, THE DEPICTED LOAD CAN BE INCREASED BY ONE CONTAINER FOR A LOAD WEIGHT OF APPROXIMATELY 42,665 POUNDS. POSITION THE ADDED CONTAINER IN STACK NUMBER 7. PIECES MARKED ② AND ③ MUST BE MOVED FROM STACK 8 TO STACK 7. TWENTY-THREE CONTAINERS CAN BE SHIPPED IN A TRAILER WHICH HAS THE REAR TANDEMS IN THE "WESTERN" POSITION OR IN A TRAILER WITH THE TANDEMS IN OTHER THAN THE "WESTERN" POSITION.
- 10. WHEN SHIPPING CONTAINERS WITH EMPTY BOMB DISPENSERS OR WHEN SHIPPING EMPTY TWIN PACK CONTAINERS, THE SECOND LAYER CAN BE FILLED AND A FULL OR PARTIAL THIRD LAYER MAY BE LOADED IN THE TRAILER. THE FORWARD BLOCKING MUST BE INCREASED TO 66" HIGH AND ONE ADDITIONAL HORIZONTAL PIECE MUST BE INSTALLED ON EACH SIDE OF THE VERTICAL PIECES AT A HEIGHT OF 63". UNITIZING STRAPS WILL BE REQUIRED TO UNITIZE THE THIRD LAYER TO THE SECOND LAYER AT EACH END OF THE THIRD LAYER PORTION, UNLESS THE CONTAINERS ARE AGAINST THE FRONT WALL OF A SQUARE-FRONT TRAILER, AGAINST A FORWARD BLOCKING ASSEMBLY, OR AGAINST AN INSTALLED BULKHEAD.

BILL OF MATERIAL			
LUMBER	LINEAR FEET BOARD FEET		
2" X 4" 2" X 6"	13 50	9 50	
NAILS	NO. REOD	POUNDS	
10d (3")	56 1		
STEEL STRAPPING, 1-1/4" 96' REOD 14 LBS SEAL FOR 1-1/4" STRAPPING 12 REOD NIL			

# LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
	22 	

TOTAL WEIGHT - - - - - - 40,943 LBS (APPROX)



- A 22-UNIT STAGGERED PATTERN LOAD IS SHOWN IN A 48"-0" LONG BY A 8"-2" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER HAVING ROUNDED FRONT CORNERS.
- 2. IF THE TRAILER TO BE LOADED HAS NAILABLE FLOORS, DOUBLED 2" X 4" LATERAL BLOCKING MAY BE USED IN LIEU OF PIECES MARKED ②. PREPOSTION 87" (APPROX) FROM A TRAILER SIDEWALL AND NAIL TO THE FLOOR W/5-10d NAILS EACH LAYER.
- 3. ALL CONTAINERS IN THE SECOND LAYER PORTION OF THE LOAD MUST BE UNITIZED TO A CONTAINER IN THE FIRST LAYER. THE UNITIZING STRAPS, PIECE MARKED ③, MUST BE INSTALLED PRIOR TO FINAL POSITIONING OF THE STACKED CONTAINERS.
- 4. IF THE SPACE AT THE REAR OF THE LOAD BETWEEN THE CONTAINERS AND THE REAR DOORS MEASURES 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE "REAR BLOCKING ASSEMBLY C" AS DETAILED ON PAGE 15. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A", PIECE MARKED (5) ON PAGE 6. SEE SPECIAL NOTE 7.
- THE LOAD QUANTITY MAY BE ADJUSTED TO COMPLY WITH THE MAXIMUM LOAD WEIGHT REQUIREMENT OR THE QUANTITY TO BE TRANSPORTED.
- FOR SHIPMENT OF LESS THAN FULL LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 10 THRU 12.
- 7. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED HEADER METHOD OF REAR BLOCKING MUST BE INSTALLED. SEE THE "PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS" ON PAGE 17 FOR GUIDANCE. NOTE THAT THE NAILED-HEADER METHOD OF REAR BLOCKING MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
- 8. THE OUTLOADING PROCEDURES SHOWN ARE BASED ON THE 27"
  HIGH WIREBOUND, WRAP-AROUND CONTAINER. THE PROCEDURES
  ARE ALSO APPLICABLE TO THE PLYWOOD TWIN PACK CONTAINERS
  WHICH ARE SLIGHTLY LESS IN HEIGHT (APPROXIMATELY
  1-3/4"). FOR GUIDANCE PERTINENT TO OUTLOADING
  PROCEDURES FOR THE PLYWOOD TWIN PACK CONTAINERS, SEE
  SPETIAL NOTE OF BELOW
- 9. WHEN SHIPPING THE PLYWOOD TWIN PACK CONTAINER, THE HEIGHT DIMENSIONS FOR THE LOAD BEARING AND LATERAL PIECES OF THE FORWARD BLOCKING MUST BE CHANGED TO 9", 35". AND 38" FROM ROTTOM TO TOP.
- 10. IF DESIRED, IT MAY BE POSSIBLE TO INCREASE THE DEPICTED LOAD BY ONE CONTAINER FOR A LOAD WEIGHT OF APPROXIMATELY 42,665 POUNDS. POSITION THE ADDED CONTAINER IN STACK NUMBER B. IF THE TRAILER BEING USED HAS ROUNDED FRONT CORNERS, THE REAR TANDEMS OF THE TRAILER MAY BE OVERLOADED. IF A SQUARE FRONT TRAILER IS BEING USED, THE DRIVE AXLES MAY BE OVERLOADED. THE LOADED TRAILER SHOULD BE WEIGHED TO ENSURE THE LOAD IS LEGAL FOR THE STATES THRU WHICH THE TRAILER WILL BE TRANSPORTED.
- 11. WHEN SHIPPING CONTAINERS WITH EMPTY BOMB DISPENSERS OR EMPTY TWIN PACK CONTAINERS, THE SECOND LAYER CAN BE FILLED AND A FULL OR PARTIAL THIRD LAYER MAY BE LOADED IN THE TRAILER. THE FORWARD BLOCKING MUST BE INCREASED TO 66° HIGH AND ONE ADDITIONAL HORIZONTAL PIECE MUST BE INSTALLED ON EACH SIDE OF THE VERTICAL PIECES AT A HEIGHT OF 63°. UNITIZING STRAPS WILL BE REQUIRED TO UNITIZE THE THIRD LAYER TO THE SECOND LAYER AT EACH END OF THE THIRD LAYER PORTION, UNLESS THE CONTAINERS ARE AGAINST THE FRONT WALL OF A SQUARE-FRONT TRAILER, AGAINST A FORWARD BLOCKING ASSEMBLY, OR AGAINST AN INSTALLED BUILDIED

BILL OF MATERIAL			
LUMBER	LINEAR FEET BOARD FEET		
1" X 6" 2" X 4" 2" X 6"	19 13 198	10 9 198	
NAILS	NO. REQD	POUNDS	
6d (2") 10d (3")	56 280	1/2 4-1/2	

STEEL STRAPPING, 1-1/4" - - 256' REOD - - - - 37 LBS SEAL FOR 1-1/4" STRAPPING - - 32 REOD - - -1-1/2 LBS

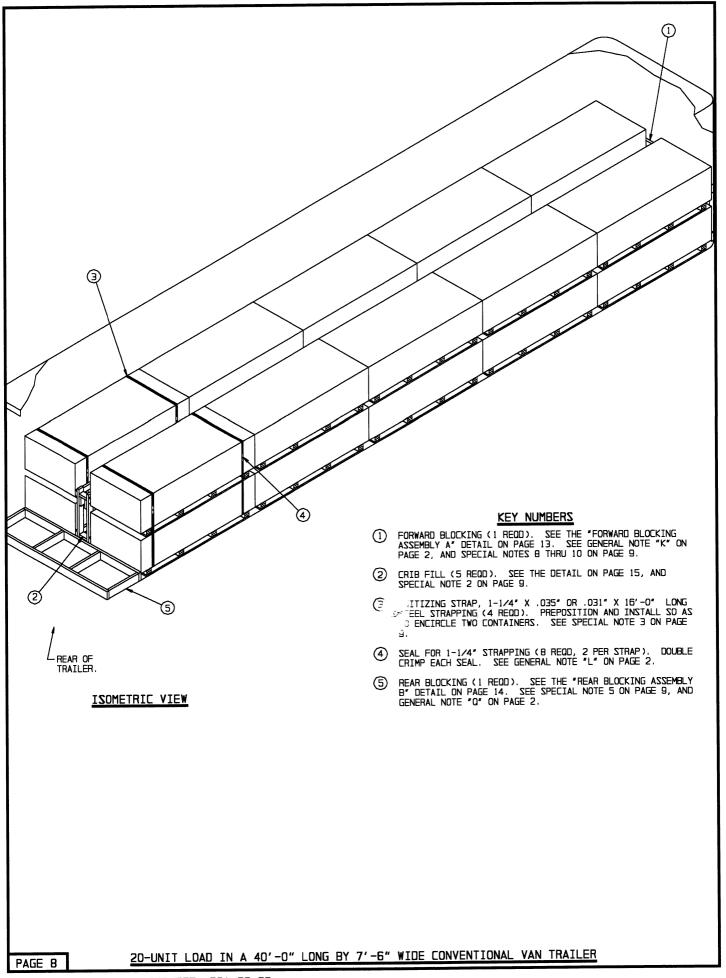
# LOAD AS SHOWN

 ITEM
 QUANTITY
 WEIGHT
 ( APPROX )

 CONTAINER - - - - - - 22 - - - - 40,810
 LBS

 DUNNAGE - - - - - - - - - - - - 478
 LBS

TOTAL WEIGHT - - - - - - 41,288 LBS (APPROX)



- 1. A 20-UNIT LOAD IS SHOWN IN A 40"-0' LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER HAVING ROUNDED FRONT CORNERS. TRAILERS OF OTHER DIMENSIONS CAN BE USED. IF THE TRAILER TO BE LOADED IS MORE THAN 7'-6" WIDE, REFER TO THE PROCEDURES DEPICTED ON PAGES 4 AND 5.
- 2. CRIB FILL, SHOWN AS PIECE MARKED ② IN THE LOAD VIEW, IS TO BE POSITIONED BETWEEN ALL LATERALLY ADJACENT CONTAINERS. NOTICE: IF A CONTAINER IS OMITTED FROM THE DEPICTED LOAD, THE CRIB FILL WHICH IS ADJACENT TO THE OMITTED CONTAINER WILL HAVE TO BE MODIFIED AS SHOWN BY THE "CRIB FILL" DETAIL ON PAGE 15.
- 3. IF THE SECOND LAYER OF THE LOAD IS NOT COMPLETE, A CONTAINER AT EACH END OF THE SECOND LAYER PORTION OF THE LOAD MUST BE UNITIZED TO A CONTAINER IN THE FIRST LAYER, UNLESS THE STACKED CONTAINERS ARE AGAINST THE FRONT WALL OF A SQUARE-FRONT TRAILER, AGAINST THE FORWARD BLOCKING ASSEMBLY, OR AGAINST AN INSTALLED BULKHEAD. UNITIZING STRAPS, PIECE MARKED ③ ON PAGE 8, MUST BE INSTALLED PRIOR TO FINAL POSITIONING OF THE STACKED CONTAINERS.
- 4. THE LOAD QUANTITY MAY BE ADJUSTED TO COMPLY WITH THE MAXIMUM LOAD WEIGHT REQUIREMENT OR THE QUANTITY TO BE TRANSPORTED.
- 5. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE CONTAINERS AND THE REAR DOORS MEASURES 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE "REAR BLOCKING ASSEMBLY C" AS DETAILED ON PAGE 15. IF THE SPACE AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE REAR BLOCKING ASSEMBLY, PIECE MARKED (5), ON PAGE 8.
- 6. FOR SHIPMENT OF LESS THAN FULL LOADS. REFER TO THE APPLICABLE GUIDANCE ON PAGES 10 THRU 12.
- 7. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED, HOWEVER, SPECIAL REAR BLOCKING MUST BE INSTALLED. SEE THE "PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS" ON PAGE 17 FOR GUIDANCE. NOTE THAT THE SPECIAL REAR BLOCKING FOR TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
- B. THE OUTLOADING PROCEDURES AS SHOWN ARE BASED ON THE 27" HIGH WIREBOUND, WRAP-AROUND CONTAINER. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE TO THE PLYWOOD TWIN PACK CONTAINERS WHICH ARE SLIGHTLY LESS IN HEIGHT (APPROXIMATELY 1-3/41). FOR GUIDANCE PERTINENT TO OUTLOADING PROCEDURES FOR THE PLYWOOD TWIN PACK CONTAINERS, SEE SPECIAL NOTE 9 BELOW.
- WHEN SHIPPING THE PLYWOOD TWIN PACK CONTAINER, THE HEIGHT DIMENSIONS FOR THE HORIZONTAL PIECES OF THE FORWARD BLOCKING MUST BE CHANGED TO 9", 35", AND 38" FROM BOTTOM TO TOP.
- 10. POSITIONING OF LOADED CONTAINERS IN A THIRD LAYER IS NOT RECOMMENDED.
- 11. WHEN SHIPPING CONTAINERS WITH EMPTY BOMB DISPENSERS OR WHEN SHIPPING EMPTY TWIN PACK CONTAINERS, A FULL OR PARTIAL THIRD LAYER MAY BE LOADED IN THE TRAILER. TWO 1-1/4" UNITIZING STRAPS WILL BE REQUIRED TO UNITIZE ALL THREE CONTAINERS IN EACH STACK.

BILL OF MATERIAL			
LUMBER	LINEAR FEET	BOARD FEET	
2" X 4" 2" X 6"	255 48	170 48	
NAILS	NO. REQD	POUNDS	
10d (3")	336	5-1/4	
STEEL STRAPPING, 1-1/4" 64' REOD 10 LBS			

| STEEL STRAPPING, 1-1/4" -- 64' REOD --- 10 LBS | SEAL FOR 1-1/4" STRAPPING -- 8 REOD --- NIL

## NWOHZ ZA DAOJ

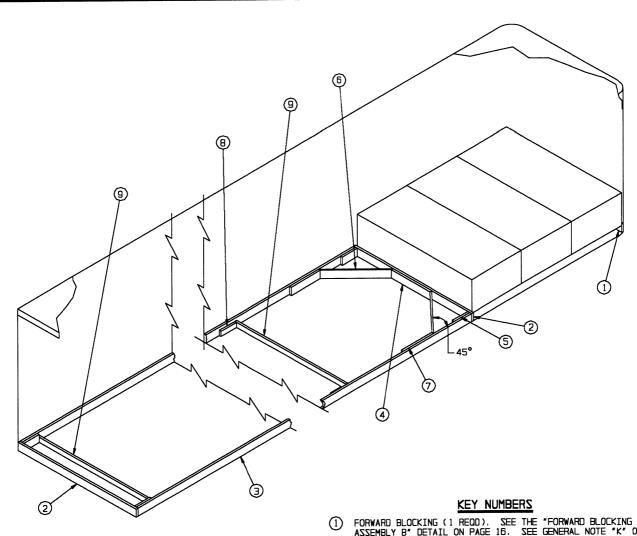
 ITEM
 QUANTITY
 WEIGHT (APPROX)

 CONTAINER - - - - - - 20 - - - - 37,100
 LBS

 DUNNAGE - - - - - - - - - - - - 452
 LBS

TOTAL WEIGHT - - - - - - 37,552 LBS (APPROX)

20-UNIT LOAD IN A 40'-0" LONG BY 7'-6" WIDE CONVENTIONAL VAN TRAILER



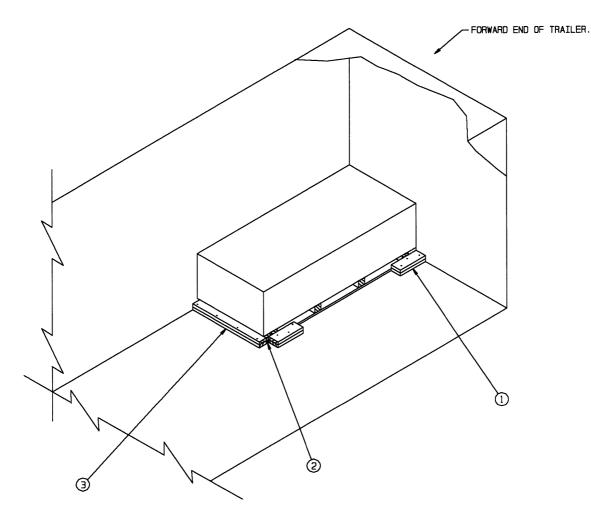
ISOMETRIC VIEW

- (1) FORWARD BLOCKING (1 REQD). SEE THE "FORWARD BLOCKING ASSEMBLY B" DETAIL ON PAGE 16. SEE GENERAL NOTE "K" ON
- 2 HEADER, 2" X 6" BY TRAILER WIDTH (CUT TO FIT) (2 REOD).
- SIDE STRUT, 2" X 6" BY CUT TO FIT BETWEEN HEADERS MARKED (2 REOD). SEE SPECIAL NOTE 2 ON PAGE 11.
- 4 CENTER CLEAT, 2" X 6" X 30" (1 REOD). NAIL TO HEADER, PIECE MARKED 2 , W/6-10d NAILS.
- (5) POCKET CLEAT, 2" X 6" X 12" (4 REOD). NAIL TO SIDE STRUT, PIECE MARKED (3), W/5-10d NAILS. TOENAIL TO ADJACENT HEADER, PIECE MARKED (2), W/3-12d NAILS. TOENAIL TO THE
- (6) DIAGONAL BRACE, 2" X 6" BY CUT TO FIT (2 REOD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO THE ADJACENT HEADER, PIECE MARKED (2), AND SIDE STRUT, PIECE MARKED (3), W/2-16d NAILS AT EACH END.
- BACK-UP CLEAT, 2" X 6" X 24" (2 REOD). NAIL TO A SIDE STRUT, PIECE MARKED  $\ensuremath{\mathfrak{J}}$  , W/B-10d NAILS.
- (B) STRUT BRACE RETAINER CLEAT, 2" X 4" X 12" (AS REOD). NAIL TO SIDE STRUT, PIECE MARKED ③, W/3-10d NAILS. SEE SPECIAL NOTE 4 ON PAGE 11.
- (9) STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" (CUT TO FIT) (MINIMUM OF ONE REOD). NAIL TO PIECES MARKED (\$) OR (\$\mathbb{B}\$), AS APPROPRIATE, W/2-12d NAILS AT EACH END.

TYPICAL LTL (3-UNIT LOAD)

- 1. A 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER IS SHOWN. TRAILERS OF OTHER WIDTHS CAN BE USED.
- 2. IF THE SIDE STRUTS SHOWN AS PIECE MARKED ③ ARE FORMED FROM MORE THAN ONE PIECE OF MATERIAL, THEY MAY BE SPLICED BY CENTERING A 2" X 6" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING W/4-10d NAILS AT EACH END. IF DESIRED, THE STRUT BRACING PIECE(S), PIECE MARKED ⑤, MAY BE NAILED TO THE SPLICE PIECES IN LIEU OF USING ADDITIONAL STRUT BRACE RETAINER CLEATS, PIECE MARKED ⑥.
- THE K-BRACE BLOCKING, SHOWN AS PIECES MARKED ② THRU ⑨, WILL RETAIN A MAXIMUM OF 20,000 POUNDS.
- 4. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO PIECE MARKED ⑤. IF THE SIDE STRUTS, PIECE MARKED ③, ARE LONGER THAN 7'-0" AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑥, AND TWO (2) STRUT BRACE RETAINER CLEATS, PIECE MARKED ⑥, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.
- 5. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED-HEADER METHOD OR REAR BLOCKING MUST BE INSTALLED IN LIEU OF THE "K-BRACE" TYPE BLOCKING. SEE THE "PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS" ON PAGE 17 FOR GUIDANCE. NOTE THAT THE NAILED-HEADER METHOD OF REAR BLOCKING MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS, AND MAY BE USED IN LIEU OF PIECES MARKED © THRU (9) WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS.

TYPICAL LTL (3-UNIT LOAD)



# ISOMETRIC VIEW

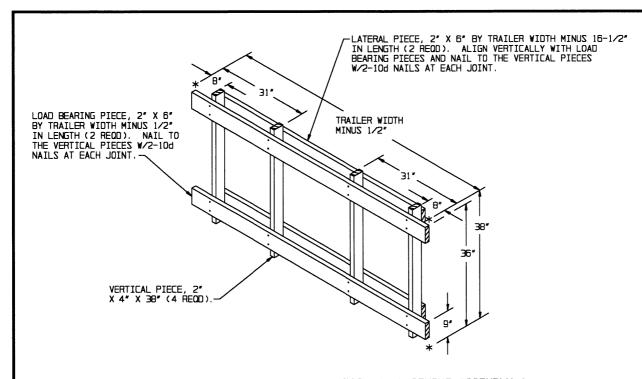
#### SPECIAL NOTES:

- A 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER WHICH HAS A NAILABLE FLOOR IS SHOWN, TRAILERS OF OTHER WIDTHS CAN BE USED.
- 2. THE HEADER, SHOWN AS PIECE MARKED ③, WILL NOT BE RELIED UPON TO RETAIN MORE THAN FIVE CONTAINERS.
- 3. IF MORE THAN ONE CONTAINER IS TO BE TRANSPORTED, THE LOAD SHOULD BE FORMED IN TWO ROWS, WITH THE CONTAINERS POSITIONED AGAINST OPPOSITE SIDEWALLS. SIDE BLOCKING, SHOWN AS PIECE MARKED ① ABOVE, MUST BE INSTALLED FOR EACH CONTAINER. IF THE TRAILER HAS ROUNDED CORNERS AT THE FORWARD END, MOVE THE CONTAINERS BACK A SUITABLE DISTANCE TO CLEAR THE ROUNDED CORNER. PRE-POSITION AN ADDITIONAL HEADER, PIECE MARKED ③, FOR EACH CONTAINER, OR PRE-POSITION A TRAILER WIDTH MINUS 1/2" HEADER, AS DESIRED.
- 4. IF THE TRAILER TO BE USED IS AT LEAST 7'-8" WIDE, CONTAINERS MAY BE POSITIONED CROSSWISE INSTEAD OF LENGTHWISE AS SHOWN. USE THE "NAILED HEADER METHOD" SHOWN ON PAGE 17. IF THE TRAILER HAS ROUNDED CORNERS AT THE FORWARD END, MOVE THE CONTAINER BACK AND INSTALL A HEADER AT THE FRONT OF THE CONTAINER.

## KEY NUMBERS

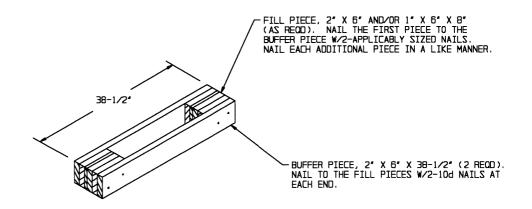
- SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (2 REOD).
  POSITION AGAINST THE ENDS OF THE CONTAINER AS SHOWN
  ABOVE. NAIL THE FIRST PIECE TO THE TRAILER FLOOR
  W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN
  A LIKE MANNER. SEE GENERAL NOTE "N" ON PAGE 2.
- (2) FILL PIECE, 2" X 4" X 39" (2 REQD). POSITION THE FIRST PIECE ON EDGE AGAINST THE CONTAINER SKID. POSITION THE SECOND PIECE ON EDGE AGAINST THE FIRST.
- (3) HEADER, 2" X 4" X 39" (DOUBLED) (1 REOD). POSITION AGAINST PIECE MARKED (2). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 3.

PAGE 12 TYPICAL LTL (1-UNIT LOAD)



# FORWARD BLOCKING ASSEMBLY A

THIS ASSEMBLY IS DESIGNED FOR USE AT THE FRONT END OF A TWO-LAYER LOAD IN A TRAILER HAVING ROUNDED CORNERS, AND IS APPLICABLE FOR A CORNER RADIUS OF NOT MORE THAN 6-1/2". IF THE RADIUS IS FROM 6-1/2" TO 8", 2" X 6" VERTICAL PIECES WILL BE USED IN LIEU OF THE 2" X 4" PIECES.

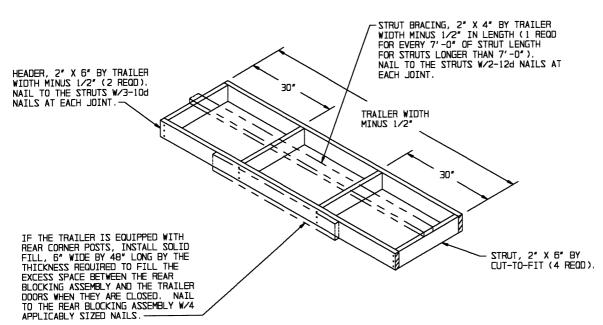


## SIDE FILL

CONSTRUCT TO BE 1/2" TO 1" LESS THAN SPACE BETWEEN CONTAINER AND TRAILER SIDEWALL.

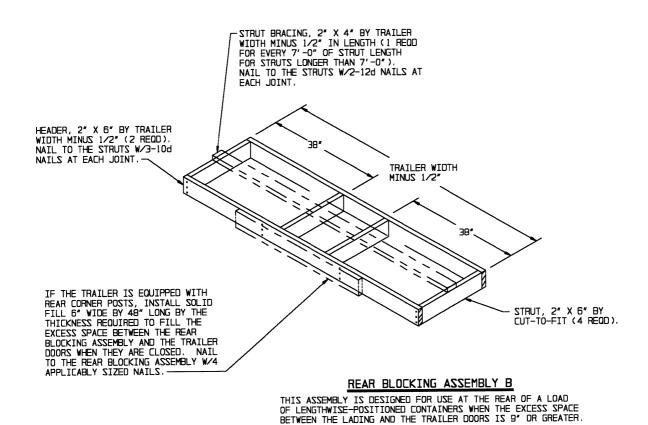
DETAILS

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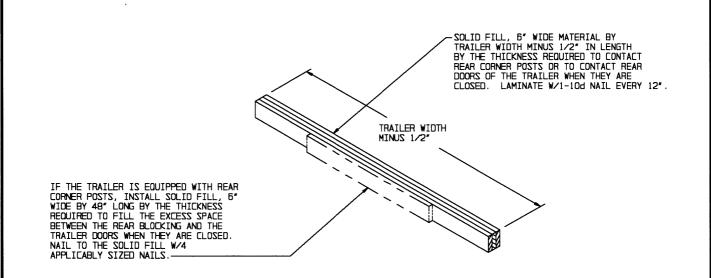


## REAR BLOCKING ASSEMBLY A

THIS ASSEMBLY IS DESIGNED FOR USE AT THE REAR OF A LOAD OF CROSSWISE-POSITIONED CONTAINERS WHEN THE EXCESS SPACE BETWEEN THE LADING AND THE TRAILER DOORS IS 9" OR GREATER.

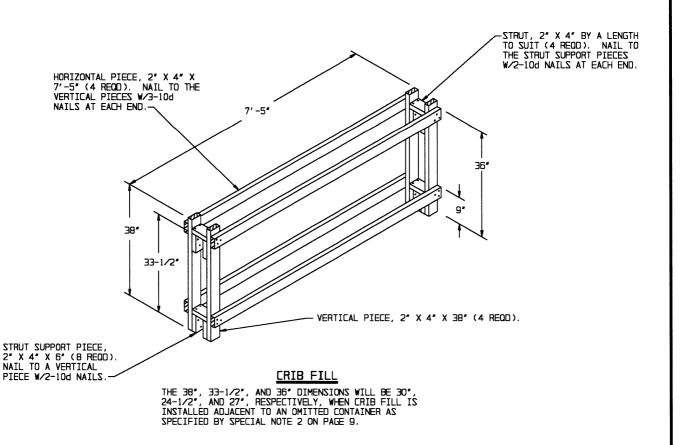


DETAILS



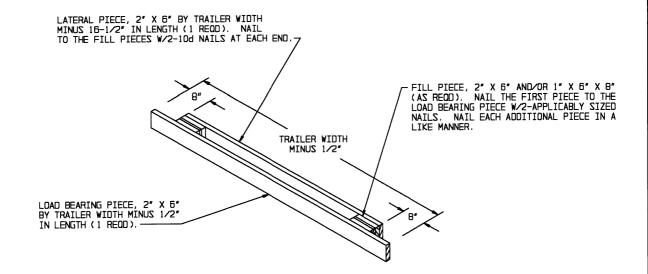
## REAR BLOCKING ASSEMBLY C

THIS REAR BLOCKING IS DESIGNED FOR USE AT THE REAR OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOORS IS LESS THAN 9".



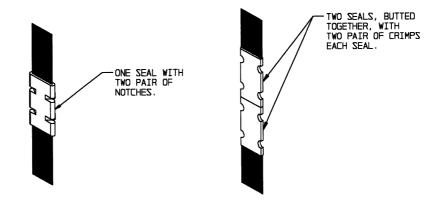
DETAILS

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# FORWARD BLOCKING ASSEMBLY B

THIS ASSEMBLY IS DESIGNED FOR USE AT THE FRONT END OF A ONE-LAYER LOAD IN A TRAILER HAVING ROUNDED CORNERS, AND IS APPLICABLE FOR A CORNER RADIUS OF NOT MORE THAN 6-1/2". IF THE RADIUS IS FROM 6-1/2" TO 8", ADDITIONAL FILL PIECES WILL BE USED.



# STRAP JOINT A

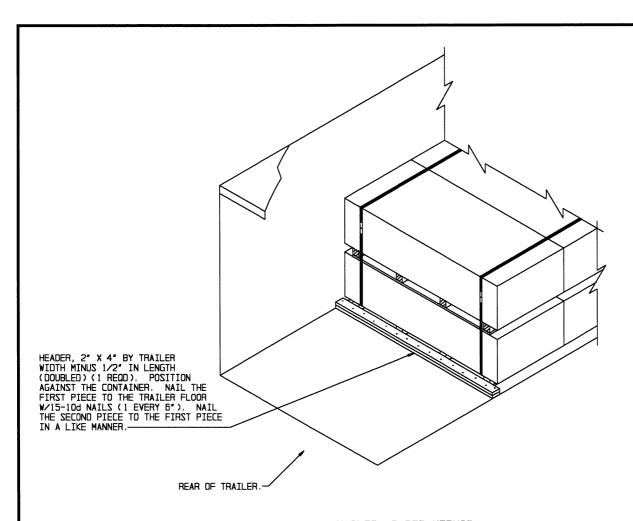
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.

# STRAP JOINT B

METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

# END-OVER-END LAP JOINT DETAILS

PAGE 16 DETAILS



# NAILED-HEADER METHOD

#### SPECIAL NOTES:

- THE NAILED-HEADER METHOD OF REAR BLOCKING DEPICTED ABOVE CAN ONLY BE USED IN TRAILERS HAVING A NAILABLE FLOOR AREA BETWEEN THE LADING AND THE METAL THRESHOLD, OR A THRESHOLD PLATE IF THE TRAILER IS SO EQUIPPED, OF AT LEAST 6"
- 2. THE NAILED-HEADER METHOD OF REAR BLOCKING IS ADEQUATE FOR THE RETENTION OF THE MAXIMUM WEIGHT LOAD.
- THE NAILED-HEADER METHOD, ALTHOUGH DESIGNED ESPECIALLY FOR TRAILERS HAVING ROLL-UP TYPE DOORS, MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.
- 4. IF DESIRED, THE NAILED-HEADER METHOD MAY BE USED FOR LOADS OF CONTAINERS POSITIONED LENGTHWISE. INSTALL CRIB FILL AS SPECIFIED BY SPECIAL NOTE 2 ON PAGE 9. TO FACILITATE NAILING OF THE HEADER, POSITION A 2" X 4" BY TRAILER WIDTH MINUS 1/2" LONG PIECE ON EDGE AGAINST THE CONTAINER SKIDS. POSITION AN ADDITIONAL 2" X 4" PIECE ON EDGE AGAINST THE FIRST. THEN POSITION AND NAIL THE HEADER.

NAILED-HEADER METHOD
PROCEDURES FOR CONVENTIONAL VAN TRAILERS EOUIPPED WITH ROLL-UP TYPE DOORS

