# LOADING AND BRACING (TL & LTL) IN VAN TRAILERS® OF 120MM CARTRIDGES PACKED IN PA116 METAL CONTAINERS, UNITIZED ON A 44" X 40" METAL PALLET

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 $<sup>^{\</sup>oplus}$  CAUTION: THE OUTLOADING PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE TO HIGHWAY MOVEMENTS, NOT TRAILER-ON-FLATCAR MOVEMENTS.

U.S. ARMY MATERIEL COMMAND DRAWING				
APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND	DRAFT	NAMZ	TECHNICIAN	ENGINEER
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APPROVED BY ORDER OF COMMANDING GENERAL, U.S.	VALIDAT ENGINEE DIVIST	RING	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE
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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	DIVISIO	N DRAWING	FILE
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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 SPECIFIED IN THIS DRAWING ARE APPLICABLE TO LOADS OF COMPLETE ROUNDS PACKED IN PA116 SERIES METAL CONTAINERS. SUBSEQUENT REFERENCE TO PALLET UNIT HEREIN MEANS THE PALLET UNIT WITH AMMUNITION ITEMS.
  SEE PAGE 3 AND AMC DRAWING 19-48-4231/48-20PM1006 FOR
  DETAILS OF THE PALLET UNIT.
- THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT 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" LONG BY 7'-6" AND 7'-8" WIDE (INSIDE DIMENSION) HAVE BEEN SHOWN. HOWEVER, THE PROCEDURES ARE 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 BRACTING PROCEDURES TRUCK VANS. THE LOADING AND BRACING PROCEDURES THULK VANS. THE LUADING AND BRALING PROLEDONES
  SPECIFIED HEREIN ARE ALSO 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.
- 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 REQUIREMENTS, 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. THE GROSS WEIGHT AND AXLE DISTRIBUTION OF WEIGHT FOR A
- A SHIPMENT WILL BE POSITIONED IN THE TRAILER NOTICE: A SHIPMENT WILL BE POSITIONED IN THE TRAILER 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 OUANTITY 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 THE FULL LOADS OF THE FULL CAUS DEPICTED HEREIN IS BASED ON AN APPROXIMATE LADING WEIGHT OF 42,000 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.
- OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF COMPLETE ROUNDS, 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 CRITERIA SPECIFIED HEREIN.
- 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 PALLET UNITS DIRECTLY AGAINST THE FORWARD PORTION OF THE TRAILER.
- 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 3 FOR GUIDANCE.

(CONTINUED AT RIGHT)

### (GENERAL NOTES CONTINUED)

- L. 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.
- M. 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 THE PIECE ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE. A LOWER PIECE.
- N. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE 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.
- O. PORTIONS OF THE TRAILERS, SUCH AS SIDEWALLS, ENDWALLS, AND ROOFS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES
- P. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE PALLET UNITS 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 THE 9". USE THE "REAR BLOCKING ASSEMBLY C" AS DEPICTED ON PAGE 14. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A" OR THE "REAR BLOCKING ASSEMBLY B", DEPENDING ON THE LOADING, AS SHOWN ON PAGE
- O. 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.
- R. LONGITUDINALLY ADJACENT PALLET UNITS IN A TRAILER WILL BE POSITIONED WITH THE BASE END AGAINST BASE END OR BELL END AGAINST BELL END. THE FRONT LOAD UNIT IN A TRAILER WILL BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS TOWARD THE FRONT WALL OF THE TRAILER.
- S. CAUTION: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, PALLET UNITS 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 BECOME NECESSARY.

### MATERIAL SPECIFICATIONS

LUMBER - - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND

FED SPEC MM-L-751.

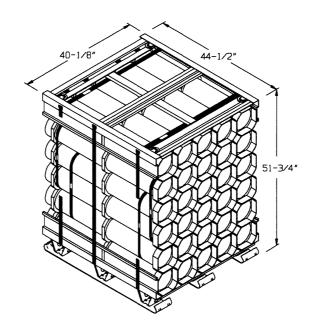
NAILS ----: FED SPEC FF-N-105; COMMON.

SEAL, STRAP ---: ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.

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

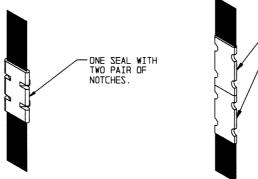
2), OR C.

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



# PALLET UNIT

CONTAINER - - - - - - - - 30 @ 75 LBS (APPROX)
UNIT WEIGHT - - - - - - 2,444 LBS (APPROX)
CUBE - - - - - - - - - 53.5 CU.FT. (APPROX)



# TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL.

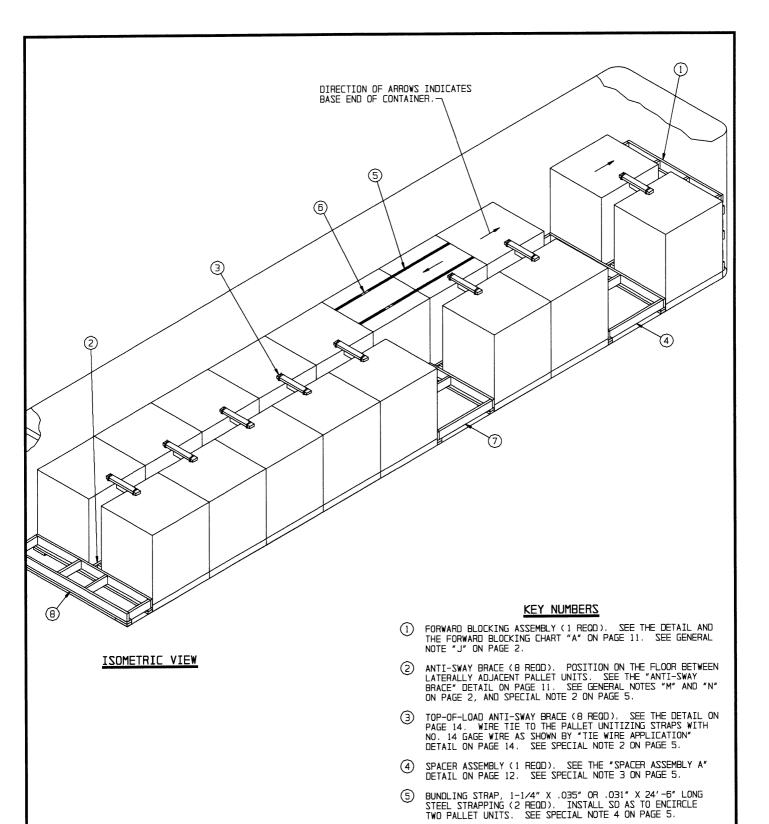
# STRAP JOINT A

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



- (5) SEAL FOR 1-1/4" STRAPPING (4 REOD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "K" ON PAGE 2.
- (7) SPACER ASSEMBLY (1 REOD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 12. SEE SPECIAL NOTE 5 ON PAGE 5.
- (B) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 13. SEE SPECIAL NOTE 6 ON PAGE 5.

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

### SPECIAL NOTES

- A 17-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) CONVENTIONAL TYPE VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
- 2. ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ②, AND TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③, IN THE LOAD ON PAGE 4 ARE TO BE POSITIONED BETWEEN ALL LATERALLY ADJACENT PALLET UNITS.
- 3. SPACER ASSEMBLY "A" SHOWN AS PIECE MARKED ④ IN THE LOAD ON PAGE 4 IS USED FOR THE PURPOSE OF PROVIDING FOR PROPER WEIGHT DISTRIBUTION, AND IS SHOWN AS TYPICAL ONLY. IF THE TRAILER TO BE LOADED IS LONGER THAN 40' THE LOCATION OF THE ASSEMBLY AND/OR THE STRUT LENGTHS, MAY BE DIFFERENT FROM WHAT IS SHOWN. IF A SHORTER TRAILER IS USED FOR THE DEPICTED LOAD, THIS ASSEMBLY MAY NOT BE REQUIRED. NOTE THAT A SPACER ASSEMBLY MUST NOT BE POSITIONED ADJACENT TO THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①.
- 4. A PALLET UNIT THAT DOES NOT HAVE A PALLET UNIT DIRECTLY OPPOSITE MUST BE SECURED BY INSTALLING BUNDLING STRAPS, SHOWN AS PIECES MARKED 5 IN THE LOAD ON PAGE 4, AROUND THAT PALLET UNIT AND THE PALLET UNIT IMMEDIATELY AD LACENT
- 5. THE SPACER ASSEMBLY SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 4, IS ONLY SHOWN TO DEPICT A TYPICAL INSTALLATION. IF A PALLET UNIT IS LOADED IN PLACE OF THE SPACER ASSEMBLY, BUNDLING STRAPS, PIECES MARKED ⑤ WILL NOT BE REQUIRED. NOTE THAT A SPACER ASSEMBLY MUST BE POSITIONED WHERE THERE WILL BE A PALLET UNIT AT EACH END; A SPACER ASSEMBLY MUST NOT BE POSITIONED ADJACENT TO THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①.
- 6. IF THE VOID AT THE REAR OF THE LOAD BETWEEN THE PALLET UNITS AND THE REAR DOOR MEASURES 1-1/2" OR LESS, THEN REAR BLOCKING IS NOT REQUIRED. IF THE VOID AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", THEN USE "REAR BLOCKING ASSEMBLY C" AS DETAILED ON PAGE 13. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, THEN USE THE REAR BLOCKING ASSEMBLY, PIECE MARKED (B), ON PAGE 4.
- REFER TO PAGE 17 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.
- 8. LEFTOVER CONTAINERS IN AN AMOUNT NOT TO EXCEED FOUR MAY BE SECURED TO THE TOP OF A FULL PALLET UNIT FOR SHIPMENT. REFER TO THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 15 FOR GUIDANCE.
- 9. 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 15. THE NAILED HEADER METHOD IS SHOWN ON PAGE 15. NOTE THAT THE SPECIAL REAR BLOCKING FOR TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.

BILL OF MATERIAL				
LUMBER	LINEAR FEET	BOARD FEET		
2" X 3" 2" X 4" 2" X 6"	2 166 131	1 111 131		
NAILS	NO REQD	ZDNUOP		
10d (3")	336	5-1/4		

STEEL STRAPPING, 1-1/4" - - 49" REQD - - - - 7 LBS SEAL FOR 1-1/4" STRAPPING - - 4 REQD - - - - NIL WIRE NO. 14 GAGE - - - - 40" REQD - - 1/2 LB

### NWOHZ ZA DAOL

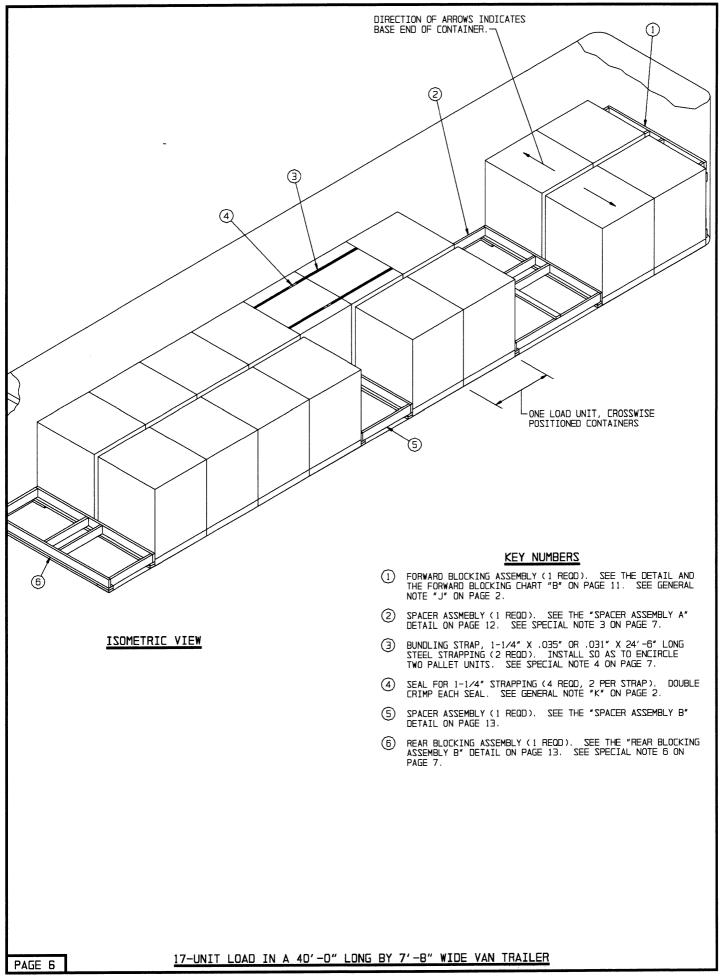
 ITEM
 QUANTITY
 WEIGHT (APPROX)

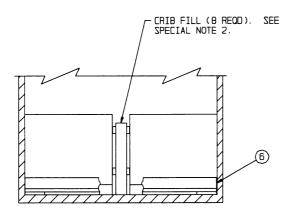
 PALLET UNIT - - - - 17 - - - - 41,548 LBS

 DUNNAGE - - - - - - - - - - - 499 LBS

TOTAL WEIGHT - - - - - - 42,047 LBS (APPROX)

17-UNIT LOAD IN A 40'-O" LONG BY 7'-6" WIDE VAN TRAILER





TYPICAL REAR VIEW OF AN 8'-2" WIDE VAN

### BILL OF MATERIAL LUMBER LINEAR FEET BOARD FEET 2" X 3" 2" X 4" 77 49 2" X 6" 144 144 NAILS NO. REQD POLINDS 10d (3") 2-3/4 12d (3-1/4") NTI STEEL STRAPPING, 1-1/4" - - 45' REOD - - - - 7 LBS SEAL FOR 1-1/4" STRAPPING - - 4 REOD - - - - NIL

### SPECIAL NOTES

- A 17-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL TYPE VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED. SEE SPECIAL NOTES 2 AND 3.
- 2. IF A TRAILER WHICH IS WIDER THAN 7'-11" IS TO BE LOADED, CRIB FILL WILL BE REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE THE "TYPICAL REAR VIEW OF AN 8'-2" WIDE VAN" AT LEFT, AND THE "CRIB FILL" DETAIL ON PAGE
- 3. SPACER ASSEMBLY "A" SHOWN AS PIECE MARKED ② IN THE LOAD ON PAGE 6 IS USED FOR THE PURPOSE OF PROVIDING FOR PROPER WEIGHT DISTRIBUTION, AND IS SHOWN AS TYPICAL ONLY. IF THE TRAILER TO BE LOADED IS LONGER THAN 40' THE LOCATION OF THE ASSEMBLY AND/OR THE STRUT LENGTHS, MAY BE DIFFERENT FROM WHAT IS SHOWN. IF A SHORTER TRAILER IS USED FOR THE DEPICTED LOAD, THIS ASSEMBLY MAY NOT BE REQUIRED. NOTE THAT A SPACER ASSEMBLY MUST NOT BE POSITIONED ADJACENT TO THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①.
- 4. A PALLET UNIT THAT DOES NOT HAVE A PALLET UNIT DIRECTLY OPPOSITE MUST BE SECURED BY INSTALLING BUNDLING STRAPS, PIECES MARKED ③, AROUND THAT PALLET AND THE PALLET UNIT IMMEDIATELY ADJACENT.
- 5. THE SPACER ASSEMBLY "B", SHOWN AS PIECE MARK®D 5 ON PAGE 6, IS SHOWN TO DEPICT A TYPICAL INSTALLATION. IF A PALLET UNIT IS LOADED IN PLACE OF THE SPACER ASSEMBLY, BUNDLING STRAPS, PIECES MARKED ③, WILL NOT BE REQUIRED. THE SPACER ASSEMBLY, PIECE MARKED ⑤, MUST NOT BE POSITIONED ADJACENT TO THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND MUST BE POSITIONED WHERE THERE WILL BE A PALLET UNIT AT EACH END OF THE ASSEMBLY.
- 6. IF THE VOID AT THE REAR OF THE LOAD BETWEEN THE PALLET UNITS AND THE REAR DOOR MEASURES 1-1/2" OR LESS, THEN REAR BLOCKING IS NOT REQUIRED. IF THE VOID AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", THEN USE "REAR BLOCKING ASSEMBLY C" AS DETAILED ON PAGE 14. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, THEN USE THE REAR BLOCKING ASSEMBLY, PIECE MARKED (6), ON PAGE 5.
- REFER TO PAGE 17 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.
- 8. LEFTOVER CONTAINERS IN AN AMOUNT NOT TO EXCEED FOUR MAY BE SECURED TO THE TOP OF A FULL PALLET UNIT FOR SHIPMENT. REFER TO THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 16 FOR GUIDANCE.
- 9. 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 15. THE NAILED HEADER METHOD IS SHOWN ON PAGE 15. NOTE THAT THE SPECIAL REAR BLOCKING FOR TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.

### LOAD AS SHOWN

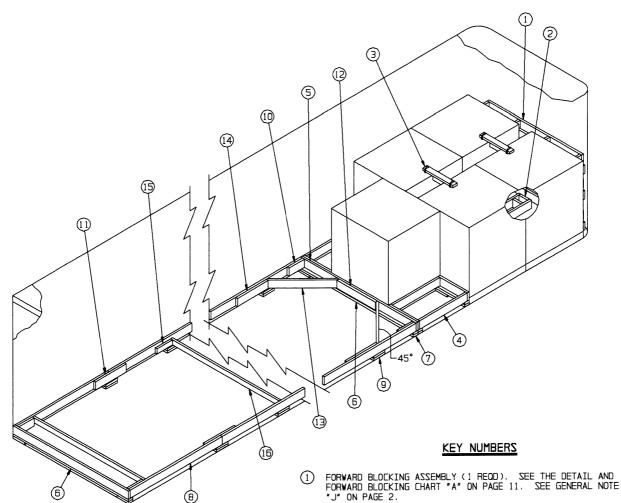
 ITEM
 QUANTITY
 WEIGHT
 (APPROX)

 PALLET UNIT
 - - - - - 17 - - - - 41,548 LBS

 DUNNAGE
 - - - - - - - - 398 LBS

TOTAL WEIGHT - - - - - - 41,946 LBS (APPROX)

17-UNIT LOAD IN A 40'-0" LONG BY 7'-8" WIDE VAN TRAILER



### ISOMETRIC VIEW

### (KEY NUMBERS CONTINUED)

- CENTER CLEAT, 2" X 6" X 30" (1 REOD). N HEADER, PIECE MARKED (5), W/6-10d NAILS. NAIL TO A (12)
- DIAGONAL BRACE, 2" X 6" BY CUT-TO-FIT (2 REOD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT 45° ANGLE AS SHOWN AND TOENAIL TO THE ADJACENT HEADER AND SIDE STRUT, PIECES MARKED (\$) AND (B) W/2-16d NAILS AT EACH END.
- BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO A SIDE (14)STRUT, PIECE MARKED (B), W/8-10d NAILS.
- STRUT BRACE RETAINING CLEAT, 2" X 4" X 12" (AS REOD). NAIL TO A SIDE STRUT, PIECE MARKED (a), W/3-10d NAILS. SEE SPECIAL NOTE 4 ON PAGE 9. (15)
- STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" IN LENGTH (MINIMUM OF 1 REOD). NAIL TO THE POCKET CLEATS, PIECES MARKED (), AND/OR TO THE STRUT BRACE RETAINING CLEATS, PIECES MARKED (), W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 4 ON PAGE 9.

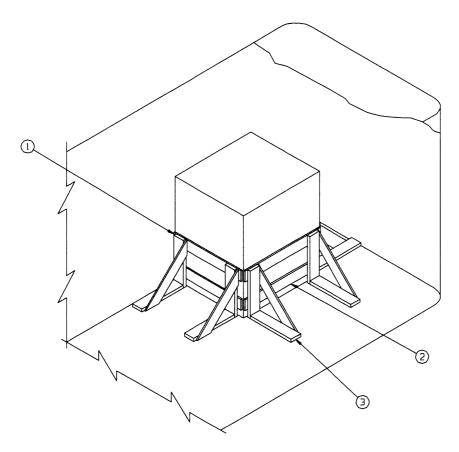
- 2 ANTI-SWAY BRACE (2 REQD). POSITION ON THE FLOOR BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 11.
- (3) TOP-OF-LOAD ANTI-SWAY BRACE (2 REOD). SEE THE "TOP-OF LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO THE PALLET UNITIZING STRAP AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 14.
- (4) SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 12. NAIL TO A HEADER, PIECE MARKED (5), W/2-10d NAILS. SEE SPECIAL NOTE 2 ON PAGE 9.
- HEADER, 2" X 6" BY TRAILER WIDTH (2 REQD). SEE SPECIAL NOTE 6 ON PAGE 9.
- (5) HEADER AND SIDE STRUT SUPPORT, 2" X 4" BY TRAILER WIDTH (2 REOD). NAIL TO THE BOTTOM EDGE OF A HEADER, PIECE MARKED (5), W/1-10d NAIL EVERY 8".
- (7) RISER PIECE, 2" X 4" X 9" (4 REOD). POSITION UNDER EACH END OF HEADER AND SIDE STRUT SUPPORT PIECES MARKED (6). NAIL TO PIECE MARKED (6) W/2-10d NAILS.
- (B) SIDE STRUT, 2" X 6" BY CUT-TO-FIT BETWEEN THE FORWARD AND REAR HEADERS, PIECES MARKED (\$) (2 REQD). SEE SPECIAL NOTE 3 ON PAGE 9.
- (9) RISER PIECE, 2" X 4" X 9" (DOUBLED) (AS REOD). LAMINATE W/2-10d NAILS. CENTER UNDER THE JOINTS OF PIECES MARKED (3) AND (4), (5) AND (6), AND UNDER THE SPLICE OF PIECES MARKED (8) W/2-10d NAILS.
- POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO A SIDE STRUT, PIECE MARKED (B), W/3-10d NAILS. TOENAIL TO THE ADJACENT HEADER, PIECE MARKED (5), W/3-12d NAILS.
- SPLICE PIECE, 2" X 6" X 24" (AS REOD). CENTER ON JOIN OF PIECES MARKED (1) AND NAIL TO SIDE STRUT MARKED (1) W/4-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE CENTER ON JOINT

(CONTINUED AT LEFT)

LTL (5-UNIT LOAD) IN A CONVENTIONAL VAN TRAILER

### SPECIAL NOTES:

- 1. A 7'-6" WIDE (INSIDE DIMENSION) VAN TRAILER IS SHOWN. TRAILERS OF OTHER WIDTHS CAN BE USED.
- 2. THE SPACER ASSEMBLIES, PIECE MARKED ④, ARE SHOWN ONLY TO DEPICT A TYPICAL INSTALLATION. SPACER ASSEMBLIES WILL BE USED WHEN A PALLET UNIT IS OMITTED. THEY MAY OR MAY NOT BE REQUIRED, DEPENDING ON THE QUANTITY OF PALLET UNITS TO BE SHIPPED.
- 3. DEPENDING ON THE NUMBER OF UNITS BEING LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED (B), MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 6" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END. CAUTION: A RISER PIECE HIELD ANAILS AT EACH END. CAUTIONED UNDER EACH SPLICE JOINT. NOTE: IF DESIRED, THE STRUT BRACING PIECE(S), PIECES MARKED (G), MAY BE NAILED TO THE SPLICE PIECES IN LIEU OF USING ADDITIONAL STRUT BRACE RETAINING CLEATS, PIECES MARKED (G).
- 4. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO PIECE MARKED (①). IF THE SIDE STRUTS, PIECES MARKED ⑥), ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑥, AND TWO STRUT BRACE RETAINING CLEATS, PIECES MARKED ⑥, AND TWO RISER PIECES MARKED ⑥), MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT
- 5. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED (\$) THRU (\$), IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF 20,000 POUNDS.
- 6. TRAILERS EQUIPPED ROLL-UP TYPE DOORS MAY BE USED;
  HOWEVER, SPECIAL REAR BLOCKING MUST BE INSTALLED. SEE
  THE "CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP
  TYPE DOORS" ON PAGE 15 FOR GUIDANCE. THE NAILED HEADER
  METHOD SHOWN ON PAGE 15 SHOULD BE USED IF POSSIBLE IN
  LIEU OF PIECES MARKED (5) THRU (6) WHICH APPLY TO
  TRAILERS HAVING NON NAILABLE FLOORS. NOTE THAT THE
  SPECIAL REAR BLOCKING FOR TRAILERS EQUIPPED WITH ROLL-UP
  TYPE DOORS MAY ALSO BE USED IN TRAILERS EQUIPPED WITH
  HINGED DOORS.
- 7. REFER TO PAGE 17 FOR GUIDANCE IN THE SHIPMENT OF PARTIAL PALLET UNITS.
- B. LEFTOVER CONTAINERS, IN AN AMOUNT NOT TO EXCEED FOUR, MAY BE SECURED TO THE TOP OF A FULL PALLET UNIT FOR SHIPMENT. REFER TO "THE PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 16 FOR GUIDANCES.



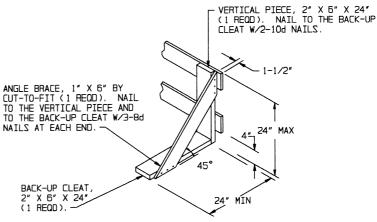
### ISOMETRIC VIEW

### SPECIAL NOTES:

- 1. A 7'-6" WIDE (INSIDE DIMENSION) TRAILER WHICH HAS A NAILABLE FLOOR IS SHOWN. TRAILERS OF OTHER WIDTHS CAN BE USED.
- 2. THE POSITIONING OF A SINGLE PALLET UNIT IS OPTIONAL. IF THE TRAILER HAS A SOUARE FRONT, THE TWO FORWARD LTL BRACES MAY BE OMITTED AND THE UNIT POSITIONED AGAINST THE END WALL.
- 3. MORE THAN ONE PALLET UNIT CAN BE SHIPPED PROVIDING THE CAPACITY OF THE LTL BRACES IS NOT EXCEEDED. THE LOAD SHOULD BE FORMED IN ROWS, WITH THE UNITS POSITIONED AGAINST OPPOSITE SIDEWALLS. THE "ANTI-SWAY BRACE", DETAILED ON PAGE 11, MUST BE INSTALLED BETWEEN LATERALLY ADJACENT UNITS. A STOP PIECE, SHOWN BY DOTTED LINES ON THE DETAIL, WILL BE REQUIRED.
- 4. EACH LTL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL SUPPORT 2,000 POUNDS OF LADING, HOWEVER, NOT LESS THAN TWO BRACES WILL BE USED AGAINST EACH PALLET UNIT ACROSS THE WIDTH OF THE TRAILER. ADDITIONAL BRACES MAY BE INSTALLED FOR THE RETENTION OF A HEAVIER LOAD.

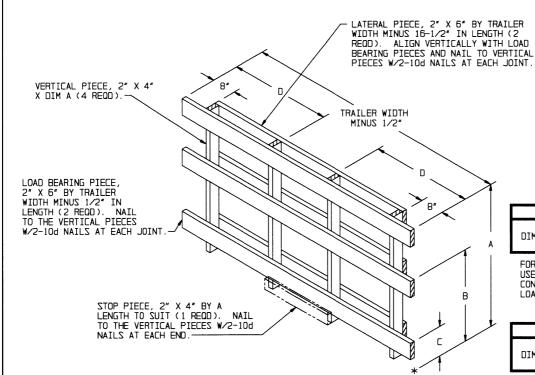
### KEY NUMBERS

- (1) LOAD BEARING PIECE, 1" X 6" X 40" (4 REOD). LOCATE AT THE HEIGHTS AS SPECIFIED IN THE "LTL BRACE" DETAIL BELOW. NAIL TO THE LTL BRACES W/4-6d NAILS AT EACH JOINT.
- (2) LOAD BEARING PIECE, 1" X 6" X 44" (2 REOD). LOCATE AT THE HEIGHTS AS SPECIFIED IN THE "LTL BRACE" DETAIL BELOW. NAIL TO THE LTL BRACES W/4-5d NAILS AT EACH JOINT.
- (3) LTL BRACE (6 REOD). SEE THE "LTL BRACE" DETAIL BELOW. NAIL TO THE TRAILER FLOOR W/10-10d NAILS.



LTL BRACE

TYPICAL LTL (1-UNIT LOAD) IN A CONVENTIONAL VAN TRAILER



FORWARD BLOCKING CHART A				
птм	Α	В	נ	
DIM	48"	31"	10"	34"

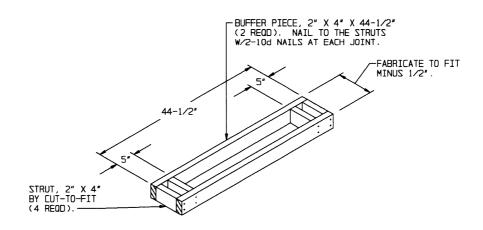
FORWARD BLOCKING CHART "A" IS USED FOR LENGTHWISE POSITIONED CONTAINERS AS SHOWN IN THE LOAD ON PAGE 4.

FORWARD BLOCKING CHART B				
птм	Α	В	С	D
DIW	51"		9"	41"

FORWARD BLOCKING CHART "B" IS USED FOR CROSSWISE POSITIONED CONTAINERS AS SHOWN IN THE LOAD ON PAGE 6. OMIT THE MIDHEIGHT LOAD BEARING PIECE, THE MIDHEIGHT LATERAL PIECE, AND THE STOP PIECE.

### FORWARD BLOCKING ASSEMBLY

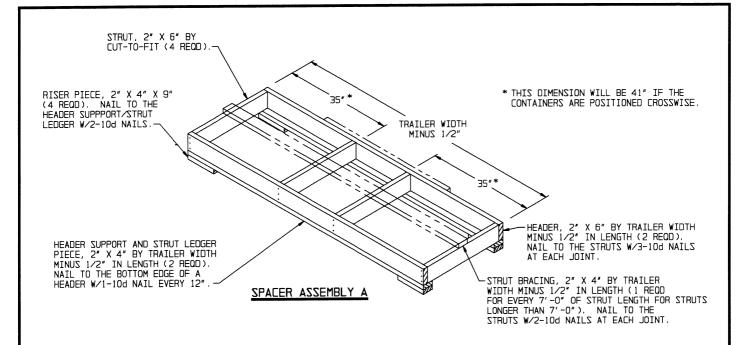
THIS ASSEMBLY IS DESIGNED FOR USE AT THE FRONT END OF A TRAILER HAVING ROUNDED CORNERS, AND IS APPLICABLE FOR A CORNER RADIUS OF NOT MORE THAN 6-1/2". IF THE RADIUS IS FROM 6-1/2" TO 8", 2" X 6" VERTICAL PIECES WILL BE USED IN LIEU OF 2" X 4" PIECES.

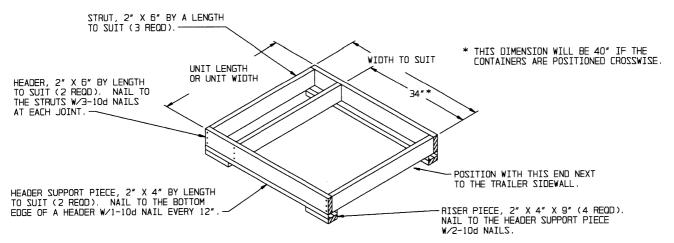


### ANTI-SWAY BRACE

THIS ASSEMBLY IS DESIGNED FOR USE ON THE FLOOR BETWEEN LATERALLY ADJACENT PALLET UNITS. NOTE THAT AN ASSEMBLY NEED NOT BE CONSTRUCTED FOR A TIGHT FIT; UP TO 1/2" VOID IS PERMITTED.

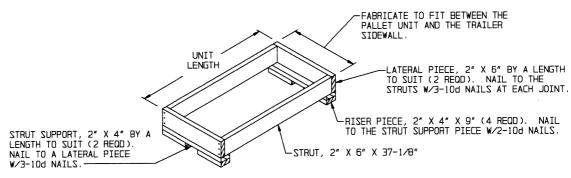
**DETAILS** 





# SPACER ASSEMBLY B

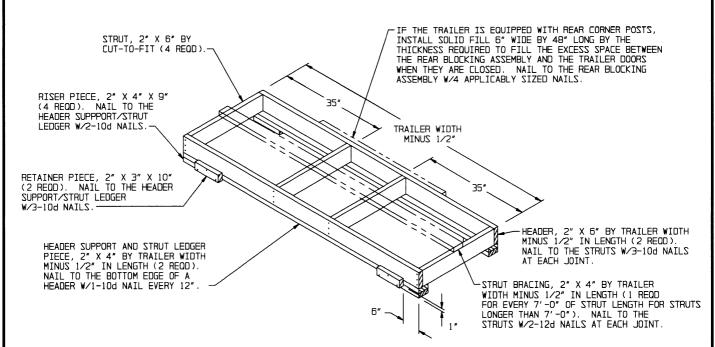
THIS ASSEMBLY IS DESIGNED FOR USE IN THE PLACE OF A PALLET UNIT WHICH IS OMITTED FROM THE LOAD IN A VAN TRAILER AS SHOWN IN THE LOAD ON PAGES 4 AND 6.



### SPACER ASSEMBLY C

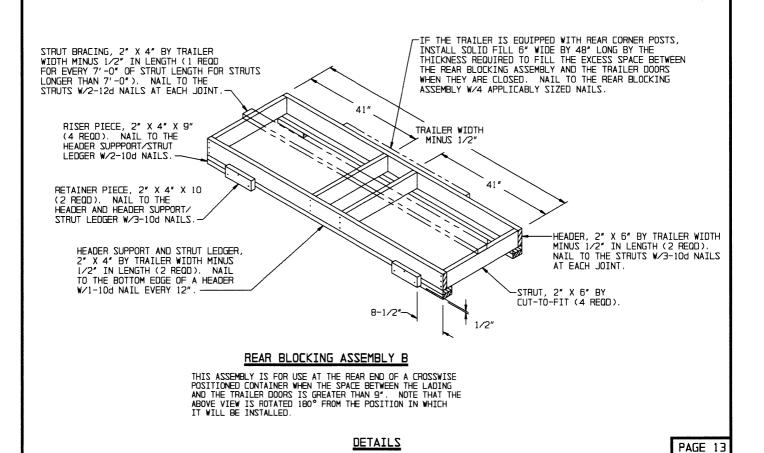
THIS ASSEMBLY IS DESIGNED FOR USE AS LATERAL BRACING OF A SINGLE PALLET UNIT AS SHOWN IN THE LOAD ON PAGE 10.

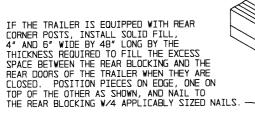
<u>DETAILS</u>

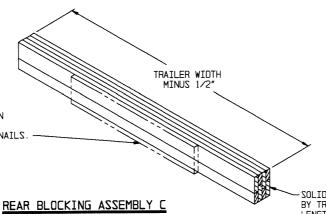


### REAR BLOCKING ASSEMBLY A

THIS ASSEMBLY IS FOR USE AT THE REAR END OF A LENGTHWISE POSITIONED CONTAINER WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOORS IS GREATER THAN 9". NOTE THAT THE ABOVE VIEW IS ROTATED 180° FROM THE POSITION IN WHICH IT WILL BE INSTALLED.

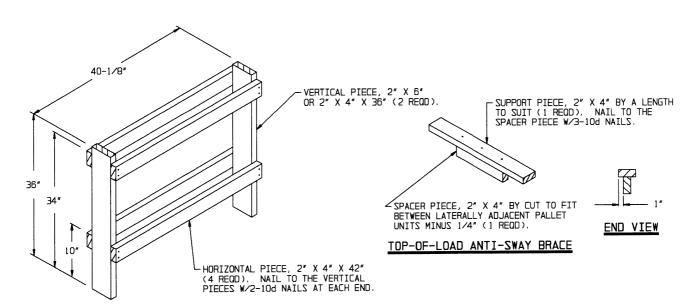






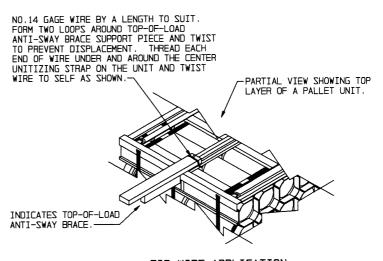
THIS REAR BLOCKING IS DESIGNED FOR USE AT THE REAR END OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOORS IS LESS THAN 9".

-SOLID FILL, 4" AND 6" WIDE MATERIAL BY TRAILER WIDTH MINUS 1/2" IN LENGTH BY THE THICKNESS REQUIRED TO CONTACT REAR DOORS OF THE TRAILER WHEN THEY ARE CLOSED. POSITION PIECES ON EDGE, ONE ON TOP OF THE OTHER AS SHOWN, AND LAMINATE W/1-10d NAIL EVERY 12".



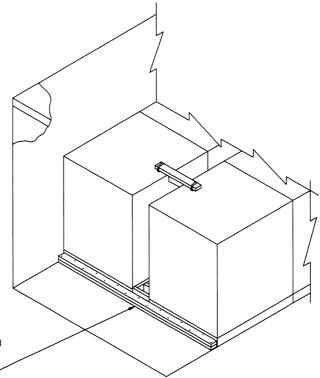
### CRIB FILL

THE DEPICTED CRIB FILL IS APPLICABLE FOR AN 8'-2" WIDE TRAILER. IF NARROWER TRAILERS ARE USED FOR THE DEPICTED LOAD, 2" X 4" VERTICAL PIECES MAY BE USED IN LIEU OF WHAT IS SHOWN. ALSO, 1" X 4" HORIZONTAL PIECES MAY BE USED TO DECREASE THE WIDTH OF THE CRIB FILL.



TIE WIRE APPLICATION

DETAILS

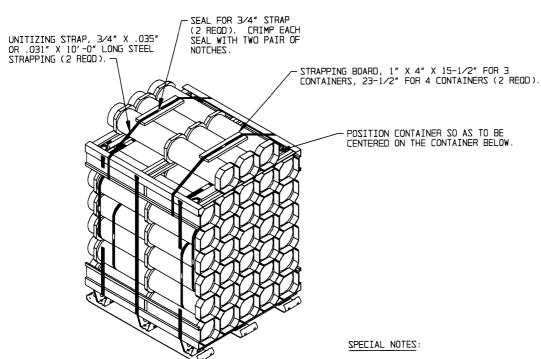


HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (DOUBLED) (1 REOD). POSITION AGAINST THE REAR BLOCKING ASSEMBLY. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/15-104 NAILS (1 EVERY 6"). NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER AND TOENAIL TO THE REAR BLOCKING ASSEMBLY W/4-104 NAILS.

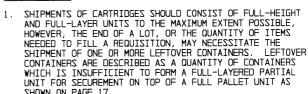
### SPECIAL NOTES:

- 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 14".
- 2. THE NAILED-HEADER METHOD OF REAR BLOCKING IS ADEQUATE FOR THE RETENTION OF THE MAXIMUM LOAD.
- 3. THE NAILED-HEADER METHOD, ALTHOUGH DESIGNED ESPECIALLY FOR TRAILERS HAVING ROLL-UP TYPE DOORS, MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.

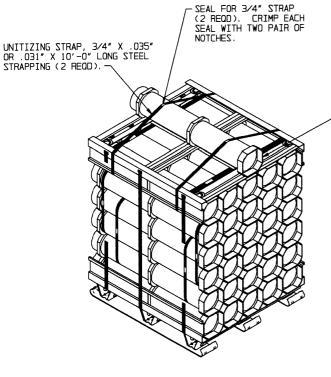
NAILED-HEADER METHOD PROCEDURES FOR CONVENTIONAL VAN TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS



### SECUREMENT OF THREE CONTAINERS



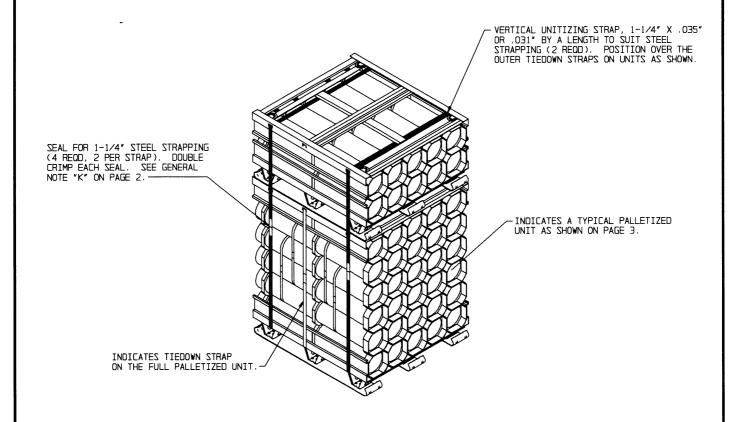
- 2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS MOTOR CARRIER SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR UPON APPROVAL FROM HIGHER HEADDUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
- 3. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.



POSITION CONTAINER SO AS TO BE CENTERED ON THE CONTAINER BELOW.

SECUREMENT OF ONE CONTAINER

PROCEDURES FOR THE SHIPMENT OF LEFTOVER CONTAINERS



# ON TOP OF A FULL PALLET UNIT

SECUREMENT OF A PARTIAL PALLET UNIT

### SPECIAL NOTES:

- 1. THE VIEW SHOWN DEPICTS A PARTIAL 2-LAYER PALLET UNIT POSITIONED ON TOP OF A FULL-HEIGHT PALLET UNIT AND UNITIZED WITH TWO VERTICAL UNITIZING STRAPS. PLACEMENT WITHIN THE LOAD IS OPTIONAL, EXCEPT THAT IT WILL NOT BE POSITIONED IN THE REAR LOAD UNIT, OR WITHIN A GROUP THAT IS BUNDLED TOGETHER.
- 2. SHIPMENT OF PALLET UNITS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE AND ON PAGE 16 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL INITS.
- THE "SHIPMENT OF A PARTIAL PALLET UNIT" PROCEDURES ON THIS PAGE ARE APPLICABLE FOR LOADS IN CONVENTIONAL TYPE VAN TRAILERS.
- 4. FOR SHIPMENT OF ONE THROUGH FOUR "LEFTOVER" CONTAINERS, SEE THE PROCEDURES ON PAGE 16.

SHIPMENT OF A PARTIAL PALLET UNIT

