

# LOADING AND BRACING (TL & LTL) IN VAN TRAILERS OF HARM (AGM-88) MISSILES PACKED IN CNU-355/E SHIPPING AND STORAGE CONTAINERS

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

U.S. ARMY MATERIEL COMMAND DRAWING			
APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND	DRAFTSMAN	TECHNICIAN	ENGINEER
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**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 IN THIS DRAWING ARE APPLICABLE TO LOADS OF HARM (AGM-88) MISSILES PACKED IN CNU-355/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CONTAINER WITH MISSILE INSTALLED. SEE PAGE 3 FOR DETAIL OF THE CONTAINER.  
  
CONTAINER DIMENSIONS -- 15'-0" LONG X 35" WIDE X  
22-5/8" HIGH (STACKING:  
20-7/16")  
GROSS WIEGHT - - - - - 2,360 POUNDS (APPROX)  
CUBE - - - - - 82.5 CUBIC FEET (APPROX)
- C. 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. REGARDLESS OF THE DIMENSIONS OF THE VAN TRAILERS SHOWN, 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 SPECIFIED BRACING IS ADEQUATE FOR LOADS WEIGHING UP TO AND INCLUDING THE MAXIMUM WEIGHTS PERMITTED BY LAW.
- D. 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.
- E. 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.
- F. 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 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.
- G. THE "LOAD AS SHOWN" FOR MOST OF THE FULL LOADS 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 LOADS, UP TO 45,000 POUNDS, IF IT IS DESIRED TO INCREASE THE LADING WEIGHT.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH MISSILE CONTAINERS, 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.

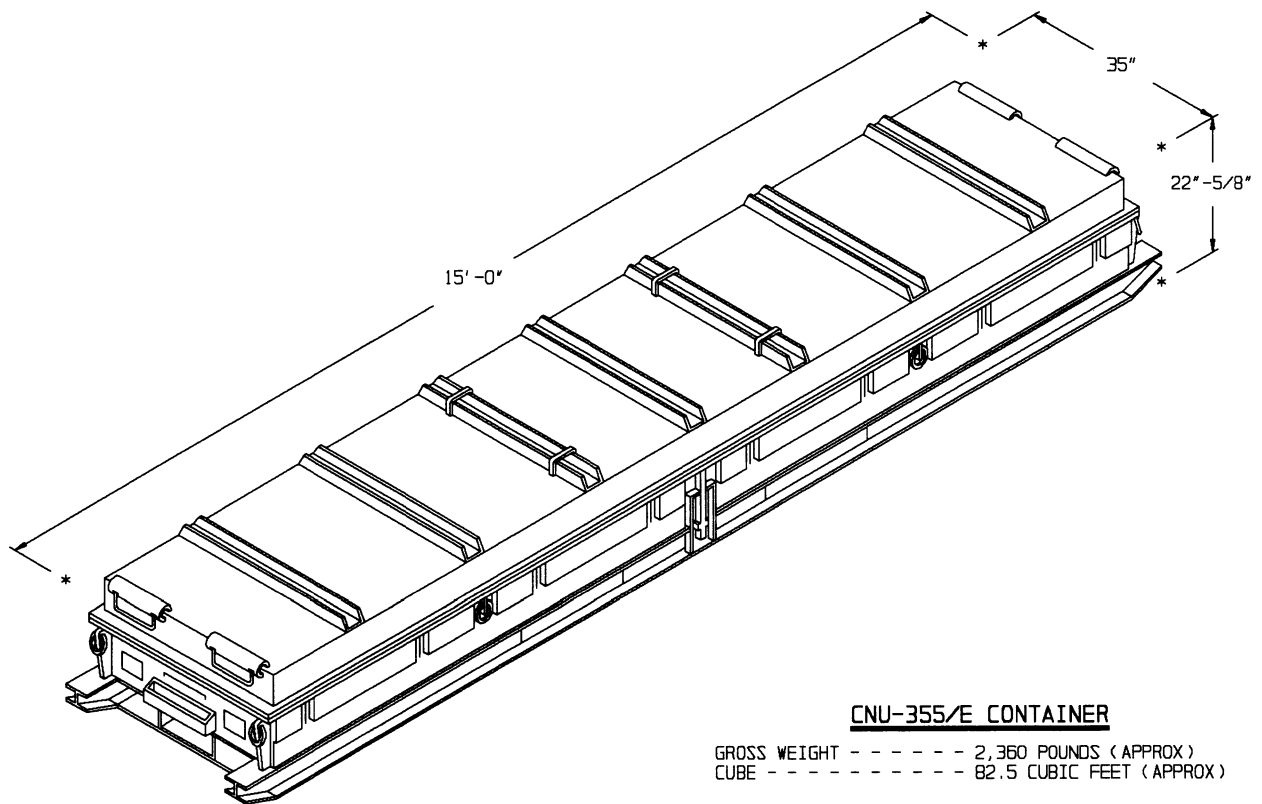
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**MATERIAL SPECIFICATIONS**

- LUMBER - - - - - : SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
- NAILS - - - - - : FED SPEC FF-N-105; COMMON.
- STRAPPING, STEEL - - : ASTM D3953; FLAT STRAPPING, TYPE 1, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
- SEAL, STRAP - - - - : ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.

**GENERAL NOTES CONTINUED**

- J. 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. SEE THE SPECIAL NOTES FOLLOWING EACH LOAD.
- K. 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 13 FOR GUIDANCE.
- 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.
- N. 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 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 B" AS DEPICTED ON PAGE 14. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN ON PAGE 14.
- Q. 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.
- R. THESE PROCEDURES CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE CNU-355/E CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM OTHER THAN THE SPECIFIED GUIDED MISSILE, OR WHEN THEY ARE EMPTY.
- S. 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.



**UNITIZATION AND HANDLING GUIDANCE**

(UNITIZATION AND HANDLING GUIDANCE CONTINUED)

1. STACKING CONTAINERS FOR LOADING.
  - A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
  - B. POSITION THE AFT END OF AN UPPER CONTAINER ABOVE THE AFT END OF THE NEXT LOWER CONTAINER.
  - C. THE CONTAINER SKIDS OF AN UPPER CONTAINER SHOULD BE FULLY SEATED AGAINST THE SKID LOCATOR PIECES ON THE COVER OF THE NEXT LOWER CONTAINER.
2. INSTALLATION OF 1-1/4" X .035" OR .031" UNITIZING STRAPPING.
  - A. EACH OF THE TWO SETS OF UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE CONTAINERS AS SHOWN IN THE LOAD DETAILS. PLACE STRAPPING THROUGH FORK RECEPTACLES OF A LOWER CONTAINER, AND SO THAT STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG SIDES AND STRAIGHT ACROSS TOP AND BOTTOM OF THE STACK.
  - B. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO DOUBLE CRIMPED STRAP SEALS AS SHOWN IN THE "END-OVER-END LAP JOINT" DETAILS ON PAGE 13. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK. DURING STRAP TENSIONING, CARE SHOULD BE EXERCISED TO ENSURE THAT THE CONTAINERS ARE NOT DAMAGED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.

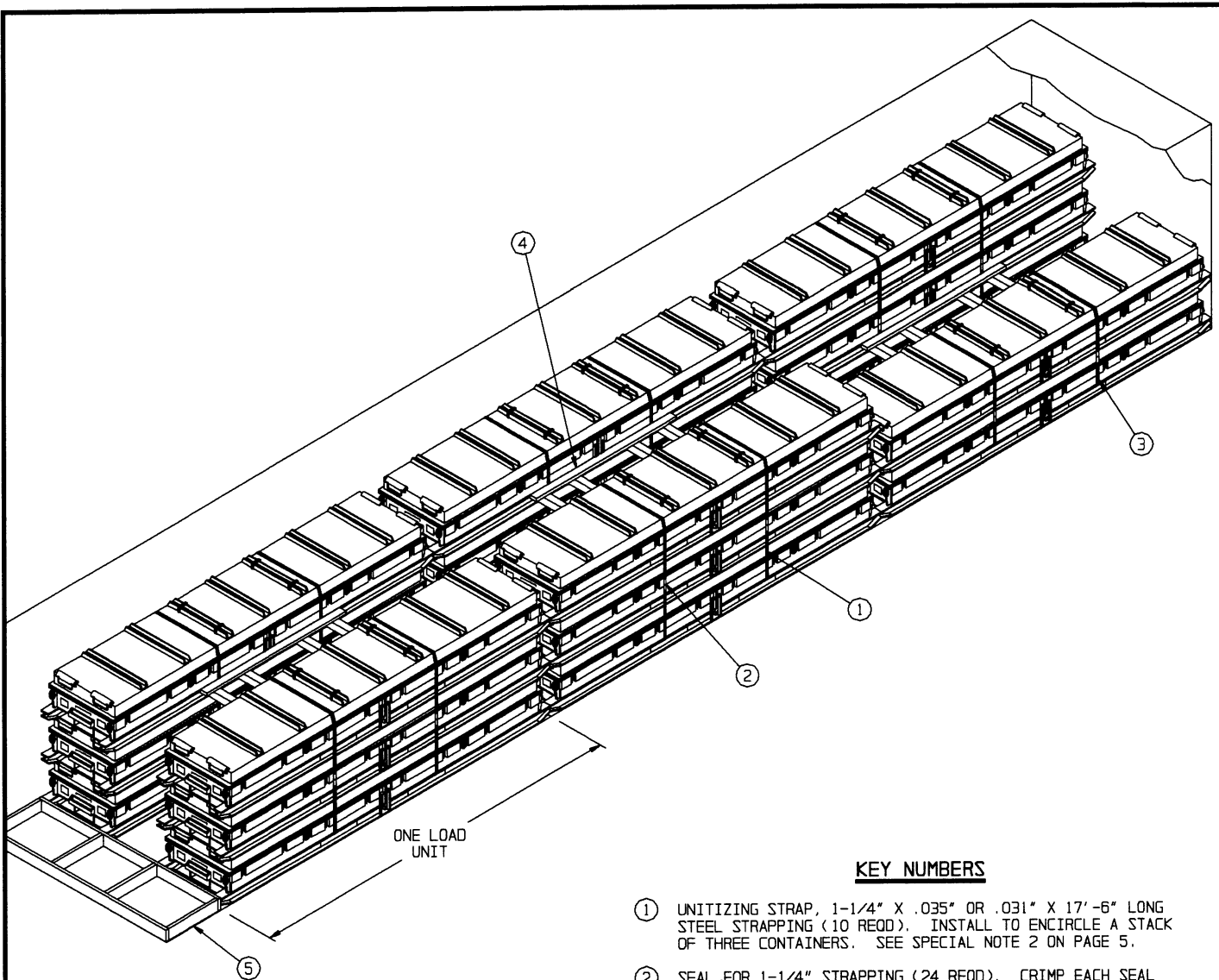
3. CONTAINER OR CONTAINER STACK HANDLING.
 

NOTES: (1) APPROVED MATERIAL HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE.

(2) PRECAUTIONARY HANDLING TECHNIQUES NORMALLY EMPLOYED OR AS SPECIFIED FOR THE TYPE OF COMMODITY INVOLVED WILL BE OBSERVED.

  - A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIALS HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS.
  - B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS SHOULD BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGE TO THE CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING BOXCAR LOADING, A UNITIZED CONTAINER STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK INTO THE FORK RECEPTACLES OF AN UPPER CONTAINER. IF ONE CONTAINER IS HANDLED BY SLINGING, THE SLING MAY BE ATTACHED TO THE LIFTING POINTS ON THE CONTAINER. HOWEVER, IF A TWO, THREE, OR FOUR-HIGH STACK IS HANDLED BY SLINGING, DO NOT ATTACH THE SLING TO THE LIFTING POINTS ON A CONTAINER. THE SLING USED MUST BE OF SUCH A DESIGN THAT THE LIFTING IS DONE ON THE BOTTOM OF THE LOWEST CONTAINER.
  - C. WHEN UNLOADING CONTAINERS, REMOVE THE LATERAL DUNNAGE, AND SHIFT THE NEAR END OF THE CONTAINER STACK TOWARDS THE CENTER OF THE TRAILER. ATTACH A CHAIN FROM THE CONTAINER LIFTING CLEVIS ON ONE SIDE OF THE CONTAINER, AROUND THE FORKLIFT MAST, TO THE CONTAINER LIFTING CLEVIS ON THE OPPOSITE SIDE OF THE CONTAINER. SLIGHTLY ELEVATE AND INSERT THE FORK TINES UNDER THE END OF THE CONTAINER STACK AND SLOWLY DRAG THE CONTAINER STACK REARWARD UNTIL IT CAN BE HANDLED FROM THE SIDE, TAKING CARE NOT TO DAMAGE THE CONTAINERS.

(CONTINUED AT RIGHT)



ISOMETRIC VIEW

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (10 REQD). INSTALL TO ENCIRCLE A STACK OF THREE CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 5.
- ② SEAL FOR 1-1/4" STRAPPING (24 REQD). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE A STACK OF TWO CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 5.
- ④ ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 15. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM AND THE THIRD LAYER OF THE LOAD UNITS WITH TWO CONTAINERS IN THE THIRD LAYER. INSTALL BETWEEN THE BOTTOM AND SECOND LAYER IN THE LOAD UNIT WITH ONE CONTAINER IN THE THIRD LAYER. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 5.
- ⑤ REAR BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 14 AND SPECIAL NOTES 4 AND 5 ON PAGE 5.

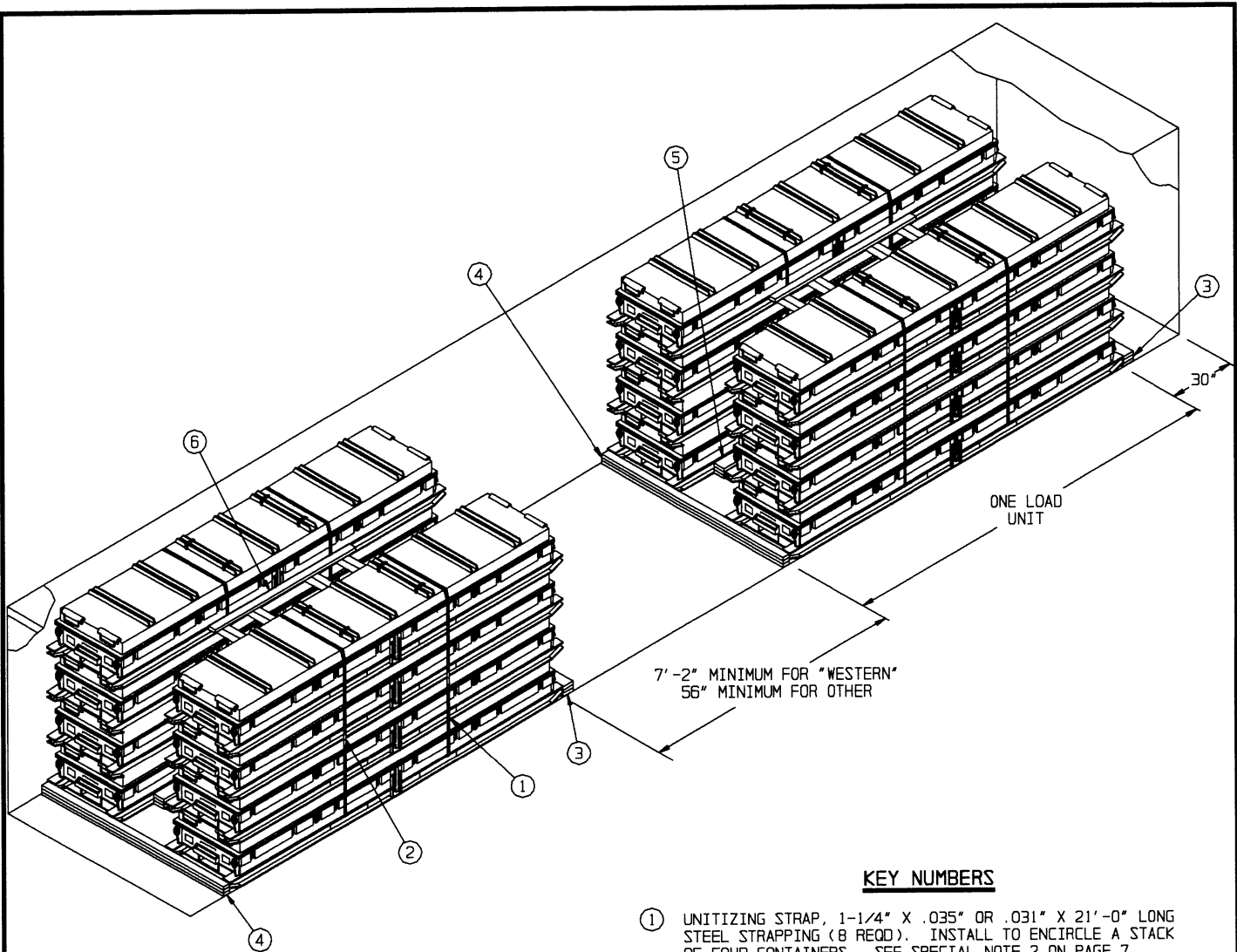
SPECIAL NOTES:

1. A 17-UNIT LOAD IS SHOWN IN A 48'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSIONS) VAN TRAILER. TRAILERS OF OTHER LENGTHS AND WIDTHS MAY BE USED. IF A TRAILER WITH ROUNDED CORNERS IS TO BE LOADED, A FORWARD BLOCKING ASSEMBLY, AS DETAILED ON PAGE 13 AND DEPICTED AS PIECE MARKED ① IN THE LOAD ON PAGE 8 MUST BE INSTALLED.
2. CONTAINERS MUST BE UNITIZED INTO STACKS OF THREE CONTAINERS PRIOR TO LOADING INTO THE VAN TRAILER. THE STACKS WILL BE FORMED AT THE REAR OF THE TRAILER BY POSITIONING THE CONTAINERS WITH ONE END RESTING JUST INSIDE THE REAR OF THE TRAILER. TWO CONTAINERS WILL BE POSITIONED ON TOP OF THE FIRST, CREATING A STACK OF THREE. THE UNITIZING STRAP WILL BE INSTALLED, AND THE STACK CAN BE PARTIALLY LIFTED FROM THE REAR AND PUSHED INTO THE TRAILER. USE CAUTION SO AS NOT TO DAMAGE THE CONTAINERS.
3. IF DESIRED IN TRAILERS HAVING A NAILABLE FLOOR, NAILED SIDE BLOCKING MAY BE USED IN LIEU OF ANTI-SWAY BRACES, PIECES MARKED ④, BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER. SIDE BLOCKING SHOULD BE TRIPLED 2" X 6" X 12" MATERIAL. POSITION AGAINST THE CONTAINER AT EACH END, AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS AND THE THIRD PIECE TO THE SECOND LIKEWISE.
4. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE REAR BLOCKING ASSEMBLY "B" AS DETAILED ON PAGE 14. IF THE SPACE AT THE REAR OF THE LOAD EXCEEDS 9", USE REAR BLOCKING ASSEMBLY "A" AS SHOWN.
5. IF THE TRAILER HAS SUFFICIENT NAILING AREA AT THE REAR OF THE LOAD, A NAILED HEADER MAY BE USED IN LIEU OF A REAR BLOCKING ASSEMBLY. SEE PIECE MARKED ④ ON PAGE 6 FOR GUIDANCE. THE HEADER WILL BE NAILED W/17-10d NAILS IN THE FIRST LAYER, 17-10d NAILS IN THE SECOND LAYER, AND 17-10d NAILS IN THE THIRD LAYER.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A THREE-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX CONTAINERS BY OMITTING ONE OR MORE FULL LOAD UNITS FROM THE LOAD; OR, THE ENTIRE TOP TIER OR TIERS CAN BE LEFT OFF; OR, ONE OR MORE CONTAINERS CAN BE OMITTED FROM THE TOP TIER.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	76	51
2" X 6"	26	26
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
10d (3")	24	1/2
12d (3-1/4")	144	2-1/2
STEEL STRAPPING, 1-1/4" - - 203' REQD - -		29.00 LBS
SEAL FOR 1-1/4" STRAPPING - - 24 REQD - -		1.09 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - - - - -	17 - - - - -	40,120 LBS
DUNNAGE - - - - -	- - - - -	402 LBS
TOTAL WEIGHT - - - - -		40,522 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① UNITIZING STRAP, 1-1/4" X .035" OR .031" X 21'-0" LONG STEEL STRAPPING (8 REQD). INSTALL TO ENCIRCLE A STACK OF FOUR CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 7.
- ② SEAL FOR 1-1/4" STRAPPING (16 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ③ FRONT HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (TRIPLED) (2 REQD). POSITION AGAINST THE FORWARD END OF THE LOAD UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS. NAIL THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.
- ④ REAR HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (TRIPLED) (2 REQD). POSITION AGAINST THE REAR OF THE LOAD UNITS. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.
- ⑤ SIDE BLOCKING, 2" X 6" X 18" (TRIPLED) (8 REQD). POSITION AGAINST THE CONTAINERS AT EACH END. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.
- ⑥ ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 15. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE TOP LAYER. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

SPECIAL NOTES:

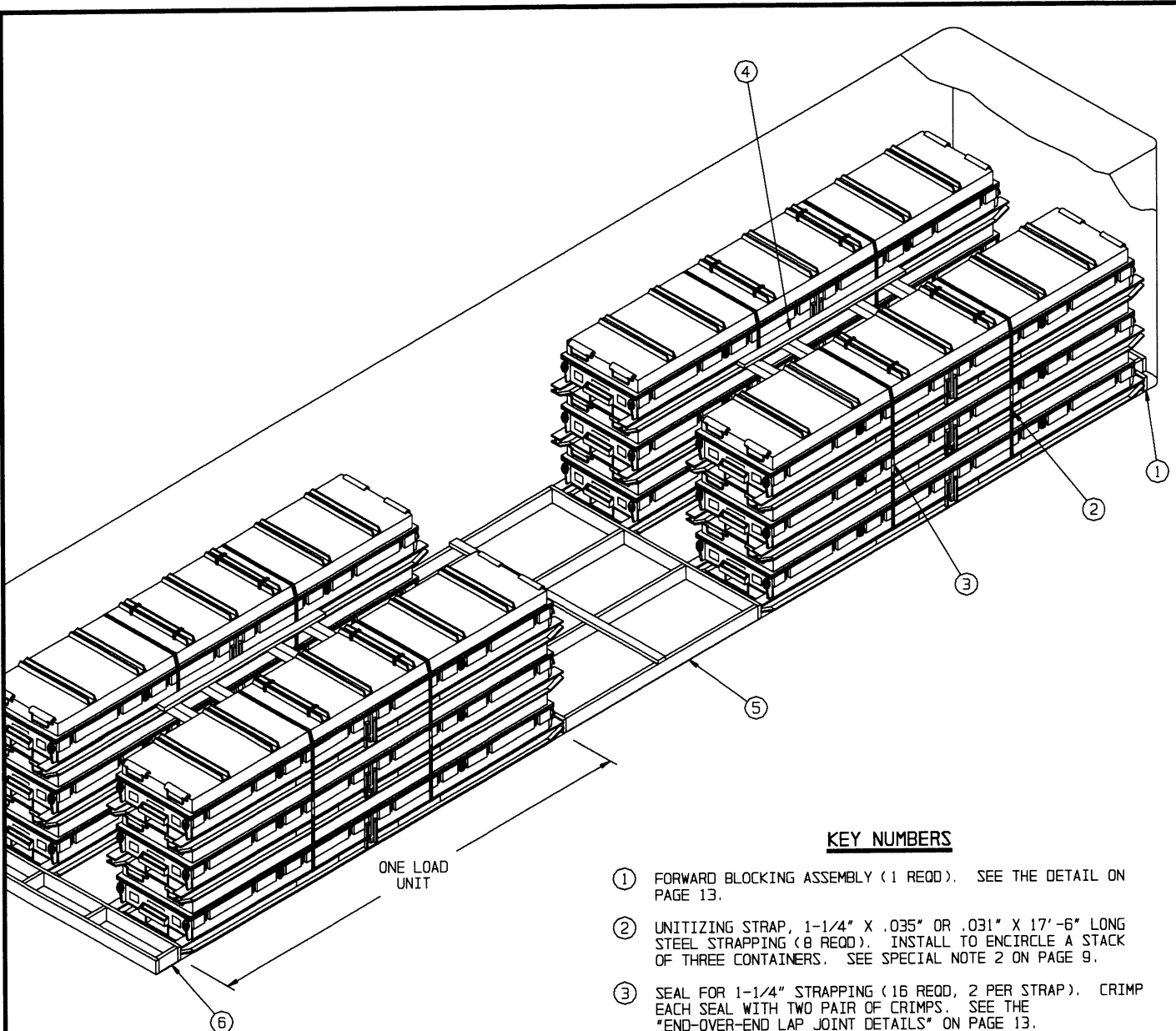
1. A 16-UNIT LOAD IS SHOWN IN A 45'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSIONS) VAN TRAILER. TRAILERS OF OTHER LENGTHS AND WIDTHS MAY BE USED. IF A TRAILER WITH ROUNDED CORNERS IS TO BE LOADED, A FORWARD BLOCKING ASSEMBLY, AS DETAILED ON PAGE 13 AND DEPICTED AS PIECE MARKED ① IN THE LOAD ON PAGE 8 MUST BE INSTALLED, IF THE FORWARD FRONT HEADER IS NOT USED AND THE LOAD UNIT IS SHIFTED TO THE FRONT WALL OF THE TRAILER.
2. CONTAINERS MUST BE UNITIZED INTO STACKS OF FOUR CONTAINERS PRIOR TO LOADING INTO THE VAN TRAILER. THE STACKS WILL BE FORMED AT THE REAR OF THE TRAILER BY POSITIONING THE CONTAINERS WITH ONE END RESTING JUST INSIDE THE REAR OF THE TRAILER. THREE CONTAINERS WILL BE POSITIONED ON TOP OF THE FIRST, CREATING A STACK OF FOUR. THE UNITIZING STRAP WILL BE INSTALLED, AND THE STACK CAN BE PARTIALLY LIFTED FROM THE REAR AND PUSHED INTO THE TRAILER. USE CAUTION SO AS NOT TO DAMAGE THE CONTAINERS.
3. A REAR BLOCKING ASSEMBLY MAY BE USED AT THE REAR OF THE LOAD IN PLACE OF THE NAILED HEADER, IF DESIRED. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE REAR BLOCKING ASSEMBLY "B" AS DETAILED ON PAGE 14. IF THE SPACE AT THE REAR OF THE LOAD EXCEEDS 9", USE REAR BLOCKING ASSEMBLY "A" AS SHOWN.
4. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A FOUR-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF EIGHT CONTAINERS BY OMITTING ONE OR MORE FULL LOAD UNITS FROM THE LOAD; OR, THE ENTIRE TOP TIER OR TIERS CAN BE LEFT OFF; OR, ONE OR MORE CONTAINERS CAN BE OMITTED FROM THE TOP TIER.

**BILL OF MATERIAL**

LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	62	42
2" X 6"	85	85
4" X 4"	27	36
NAILS	NO. REQD	POUNDS
10d (3")	178	2-3/4
12d (3-1/4")	48	1
20d (4")	20	3/4
STEEL STRAPPING, 1-1/4" -- 168' REQD -- 24.00 LBS		
SEAL FOR 1-1/4" STRAPPING -- 16 REQD -- 0.80 LBS		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	16	37,760 LBS
DUNNAGE		356 LBS
TOTAL WEIGHT		38,116 LBS (APPROX)



**ISOMETRIC VIEW**

ONE LOAD UNIT

**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 13.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (8 REQD). INSTALL TO ENCIRCLE A STACK OF THREE CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 9.
- ③ SEAL FOR 1-1/4" STRAPPING (16 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ④ ANTI-SWAY BRACE (4 REQD). SEE THE DETAIL ON PAGE 15. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM AND TOP LAYERS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 9.
- ⑤ SPACER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 15 AND SPECIAL NOTE 5 ON PAGE 9.
- ⑥ REAR BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 14 AND SPECIAL NOTE 4 ON PAGE 9.



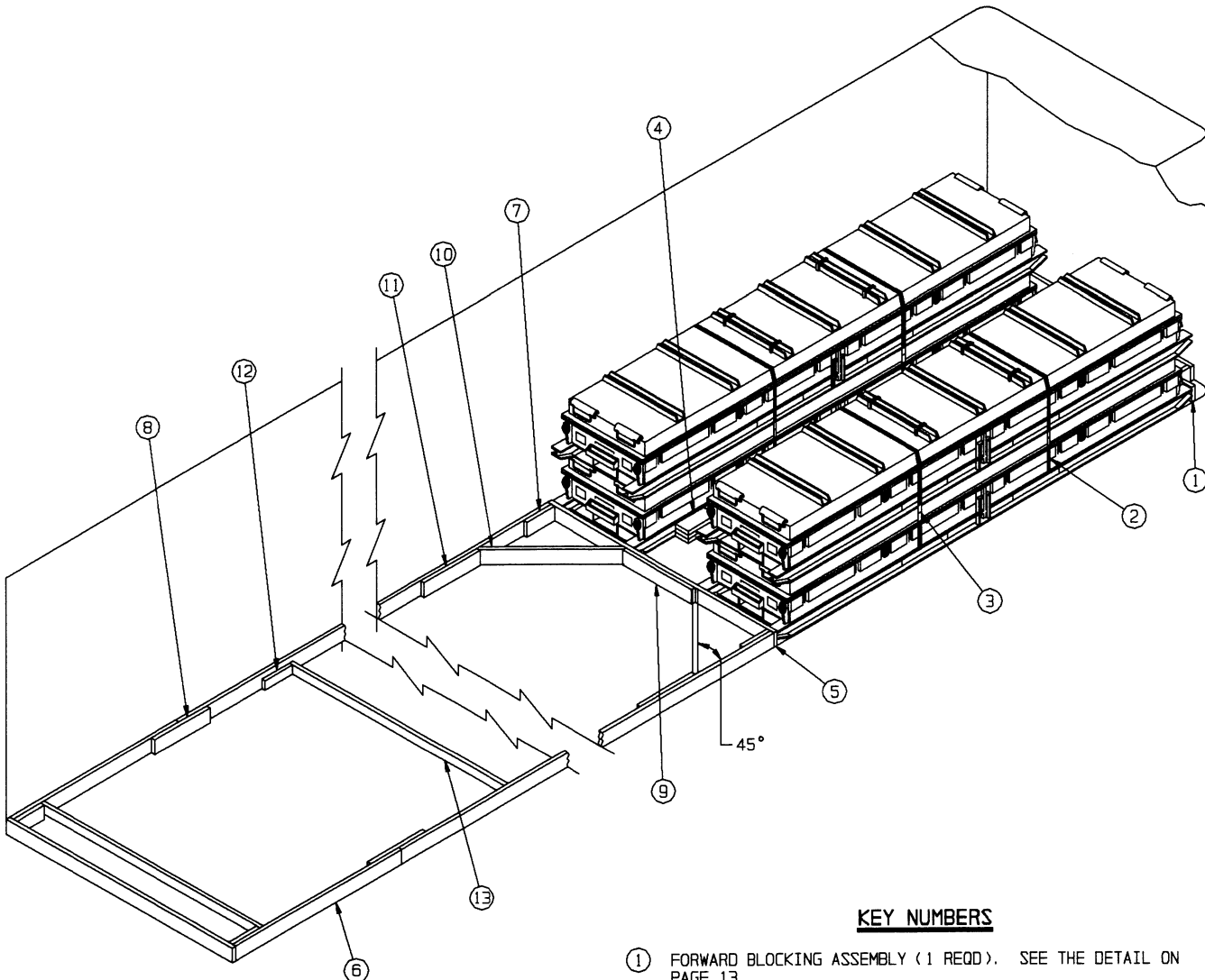
**SPECIAL NOTES:**

1. A 12-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSIONS) VAN TRAILER. TRAILERS OF OTHER LENGTHS AND WIDTHS MAY BE USED. IF A TRAILER WITH SQUARE CORNERS IS TO BE LOADED, ELIMINATE THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND INSTALL THE CONTAINERS DIRECTLY AGAINST THE ENDWALL.
2. CONTAINERS MUST BE UNITIZED INTO STACKS OF THREE CONTAINERS PRIOR TO LOADING INTO THE VAN TRAILER. THE STACKS WILL BE FORMED AT THE REAR OF THE TRAILER BY POSITIONING THE CONTAINERS WITH ONE END RESTING JUST INSIDE THE REAR OF THE TRAILER. TWO CONTAINERS WILL BE POSITIONED ON TOP OF THE FIRST, CREATING A STACK OF THREE. THE UNITIZING STRAPS WILL BE INSTALLED, AND THE STACK CAN BE PARTIALLY LIFTED FROM THE REAR AND PUSHED INTO THE TRAILER. USE CAUTION SO AS NOT TO DAMAGE THE CONTAINERS.
3. IF DESIRED IN TRAILERS HAVING A NAILABLE FLOOR, NAILED SIDE BLOCKING MAY BE USED IN LIEU OF ANTI-SWAY BRACES, PIECES MARKED ④, BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER. SIDE BLOCKING SHOULD BE TRIPLED 2" X 6" X 12" MATERIAL. POSITION AGAINST THE CONTAINER AT EACH END, AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS AND THE THIRD PIECE TO THE SECOND LIKEWISE.
4. IF THE SPACE AT THE REAR OF THE LOAD IS GREATER THAN 1-1/2" BUT LESS THAN 9", USE REAR BLOCKING ASSEMBLY "B" AS DETAILED ON PAGE 14. IF THE SPACE AT THE REAR OF THE LOAD EXCEEDS 9", USE REAR BLOCKING ASSEMBLY "A" AS SHOWN.
5. THE SPACER ASSEMBLY, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 8, IS TO BE 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 STRUT LENGTHS MAY BE DIFFERENT FROM WHAT IS SHOWN. NOTE THAT THE SPACER ASSEMBLY MUST NOT BE POSITIONED ADJACENT TO THE FORWARD BLOCKING ASSEMBLY.
6. IF THE TRAILER HAS SUFFICIENT NAILING AREA AT THE REAR OF THE LOAD, A NAILED HEADER MAY BE USED IN LIEU OF A REAR BLOCKING ASSEMBLY. SEE PIECE MARKED ④ ON PAGE 6 FOR GUIDANCE. THE HEADER WILL BE NAILED W/12-10d NAILS IN THE FIRST LAYER, 12-10d NAILS IN THE SECOND LAYER, AND 12-10d NAILS IN THE THIRD LAYER.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A THREE-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX CONTAINERS BY OMITTING ONE OR MORE FULL LOAD UNITS FROM THE LOAD; OR, THE ENTIRE TOP TIER OR TIERS CAN BE LEFT OFF; OR, ONE OR MORE CONTAINERS CAN BE OMITTED FROM THE TOP TIER.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	59	40
2" X 6"	94	94
4" X 4"	54	72
NAILS	NO. REQD	POUNDS
10d (3")	80	1-1/4
12d (3-1/4")	96	1-3/4
STEEL STRAPPING, 1-1/4" -- 140' REQD -- 20.00 LBS		
SEAL FOR 1-1/4" STRAPPING -- 16 REQD -- 0.80 LBS		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	12	28,320 LBS
DUNNAGE		438 LBS
TOTAL WEIGHT		28,758 LBS (APPROX)



**ISOMETRIC VIEW**

(KEY NUMBERS CONTINUED)

- ⑩ DIAGONAL BRACE, 2" X 6" BY CUT-TO-FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO THE ADJACENT HEADER AND SIDE STRUT, PIECES MARKED ⑤ AND ⑥, W/2-16d NAILS AT EACH END.
- ⑪ BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO A SIDE STRUT, PIECE MARKED ⑥, W/8-10d NAILS.
- ⑫ STRUT BRACE RETAINING CLEAT, 2" X 4" X 12" (AS REQD). NAIL TO A SIDE STRUT, PIECE MARKED ⑥, W/3-10d NAILS. SEE SPECIAL NOTE 3 ON PAGE 11.
- ⑬ STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" IN LENGTH (MINIMUM OF ONE REQUIRED). NAIL TO THE POCKET CLEATS, PIECES MARKED ⑦, AND/OR TO THE STRUT BRACE RETAINING CLEATS, PIECES MARKED ⑫, W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 11.

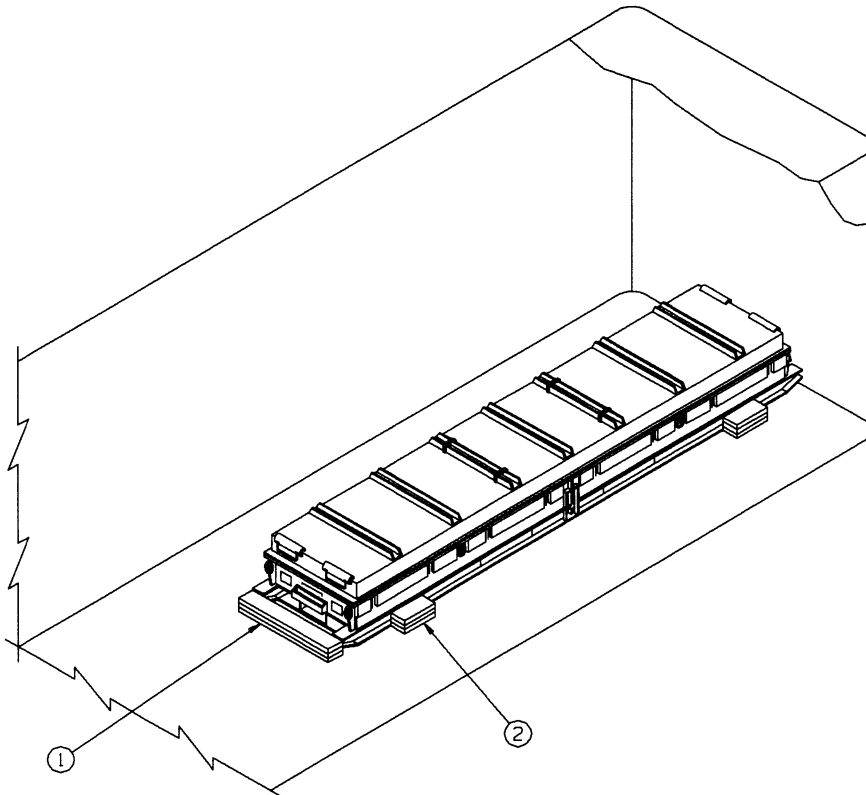
**KEY NUMBERS**

- ① FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 13.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE A STACK OF TWO CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 11.
- ③ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 13.
- ④ SIDE BLOCKING 2" X 6" X 12" (TRIPLED) (4 REQD). POSITION AGAINST THE CONTAINERS AT EACH END. NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.
- ⑤ HEADER, 2" X 6" X TRAILER WIDTH (2 REQD).
- ⑥ SIDE STRUT, 2" X 6" BY CUT-TO-FIT BETWEEN THE FORWARD AND REAR HEADERS, PIECES MARKED ⑤ (2 REQD). SEE SPECIAL NOTE 3 ON PAGE 11.
- ⑦ POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO A SIDE STRUT, PIECE MARKED ⑥, W/3-10d NAILS. TOENAIL TO THE ADJACENT HEADER, PIECE MARKED ⑤, W/3-12d NAILS.
- ⑧ SPLICE PIECE, 2" X 6" X 24" (AS REQD). CENTER ON JOINT OF SIDE STRUTS, PIECES MARKED ⑥, AND NAIL TO SIDE STRUT W/4-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 11.
- ⑨ CENTER CLEAT, 2" X 6" X 30" (1 REQD). NAIL TO A HEADER, PIECE MARKED ⑤, W/6-10d NAILS.

(CONTINUED AT LEFT)

SPECIAL NOTES:

1. A 4-UNIT LOAD IS SHOWN IN AN 8'-2" WIDE (INSIDE DIMENSION) VAN TRAILER. TRAILERS OF OTHER WIDTHS MAY BE USED. IF A TRAILER WITH SQUARE CORNERS IS TO BE LOADED, ELIMINATE THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED 1, AND INSTALL THE CONTAINERS DIRECTLY AGAINST THE FRONT WALL.
2. CONTAINERS MUST BE UNITIZED INTO STACKS OF TWO CONTAINERS PRIOR TO LOADING INTO THE VAN TRAILER. THE STACKS WILL BE FORMED AT THE REAR OF THE TRAILER BY POSITIONING THE CONTAINERS WITH ONE END RESTING JUST INSIDE THE REAR OF THE TRAILER. ONE CONTAINER WILL BE POSITIONED ON TOP OF ANOTHER, THE UNITIZING STRAP WILL BE INSTALLED, AND THE STACK CAN BE PARTIALLY LIFTED FROM THE REAR AND PUSHED INTO THE TRAILER. USE CAUTION SO AS NOT TO DAMAGE THE CONTAINERS.
3. DEPENDING ON THE NUMBER OF UNITS BEING LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED ⑥, 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 JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END. NOTE: IF DESIRED, THE STRUT BRACE PIECE(S), PIECE MARKED ③, MAY BE NAILED TO THE SPLICE PIECES IN LIEU OF USING ADDITIONAL STRUT BRACE RETAINING CLEATS, PIECE MARKED ②.
4. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO PIECE MARKED ⑦. IF THE SIDE STRUTS, PIECE MARKED ⑥, ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ④, AND TWO STRUT BRACE RETAINING CLEATS, PIECE MARKED ②, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.
5. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED ⑤ THRU ⑧, IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF 20,000 POUNDS.



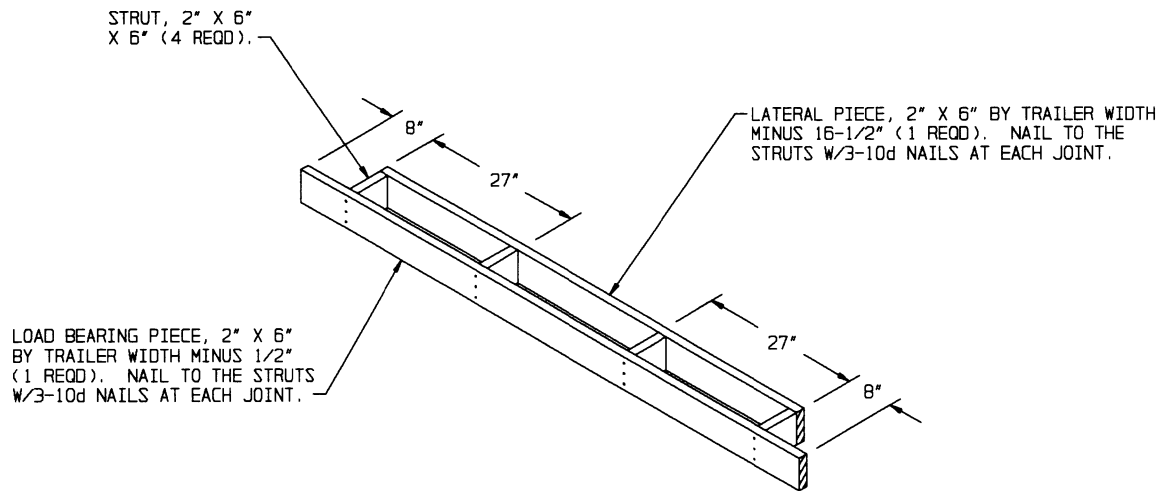
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

1. A ONE-UNIT LOAD IS SHOWN IN AN 8'-2" WIDE (INSIDE DIMENSION) VAN TRAILER. TRAILERS OF OTHER WIDTHS CAN BE USED.
2. IF MORE THAN ONE CONTAINER IS TO BE TRANSPORTED, THE LOAD SHOULD BE FORMED IN ROWS, WITH THE CONTAINERS POSITIONED AGAINST OPPOSITE SIDEWALLS, AS SHOWN IN THE LOAD DEPICTED ON PAGE 6.
3. IF THE TRAILER BEING LOADED HAS A SQUARE FRONT, THE CONTAINER MAY BE LOADED WITH ONE OF ITS SIDES IN TIGHT CONTACT WITH THE TRAILER SIDEWALL. IF LOADING A CONTAINER IN THIS MANNER, ELIMINATE TWO OF THE SIDE BLOCKING PIECES.

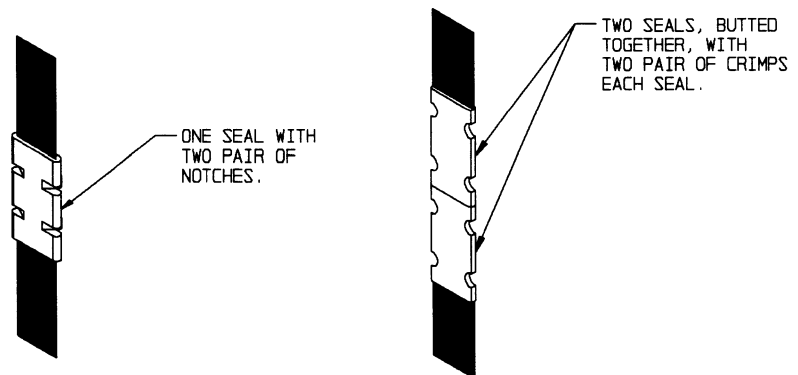
**KEY NUMBERS**

- ① HEADER, 2" X 4" X 35" (TRIPLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.
- ② SIDE BLOCKING, 2" X 6" X 12" (TRIPLED) (4 REQD). POSITION TOWARD THE END OF CONTAINER AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/4-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST AND THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.



**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 GREATER THAN 6-1/2", INCREASE THEN LENGTH OF THE STRUTS APPROPRIATELY.



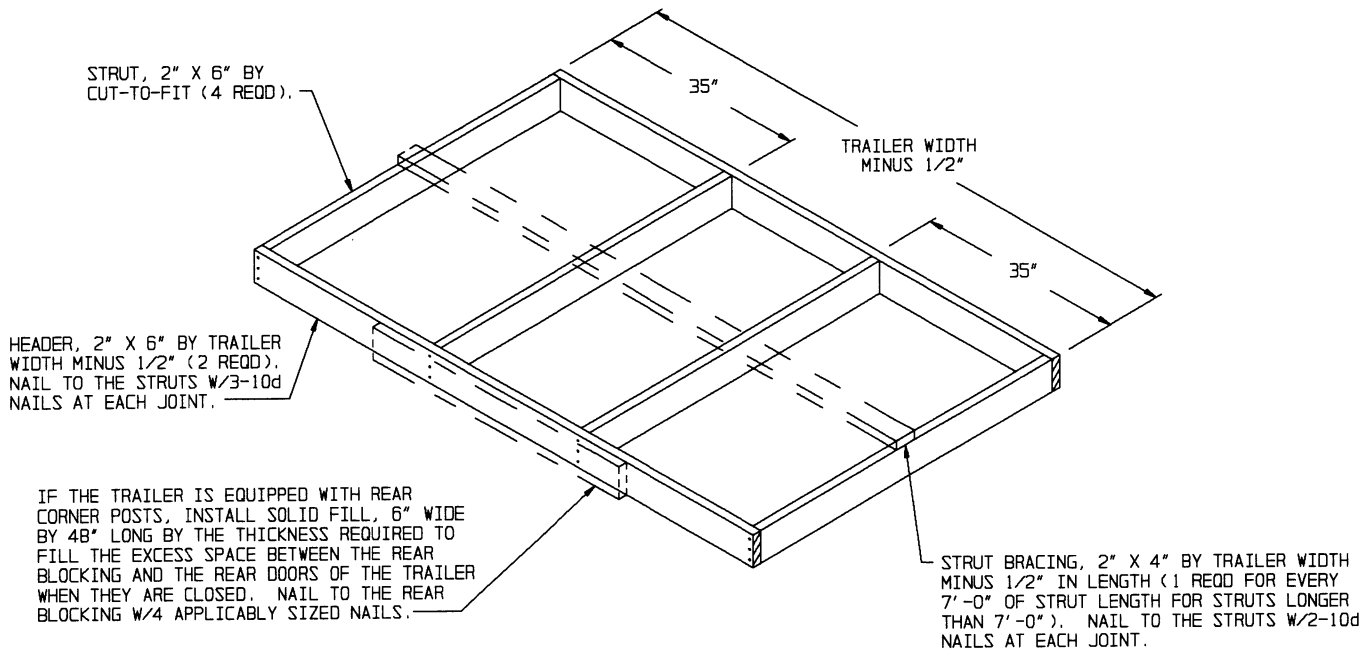
**STRAP JOINT A**

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

**STRAP JOINT B**

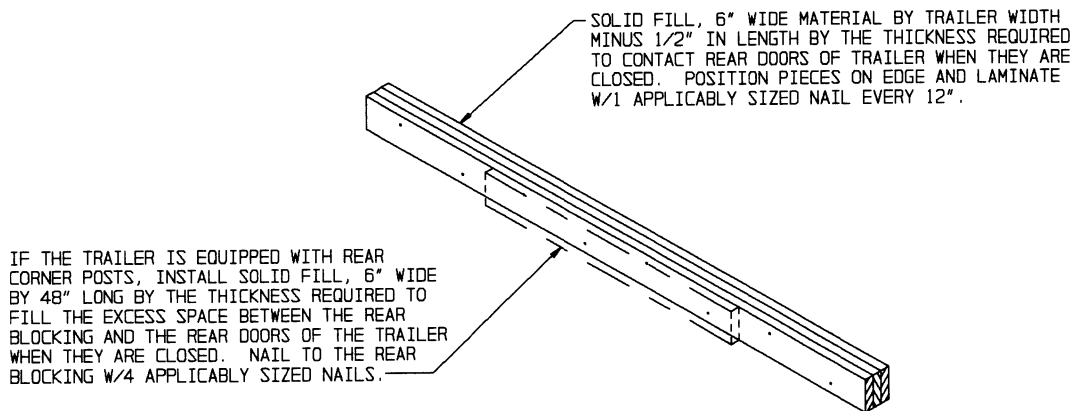
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

**END-OVER-END LAP JOINT DETAILS**



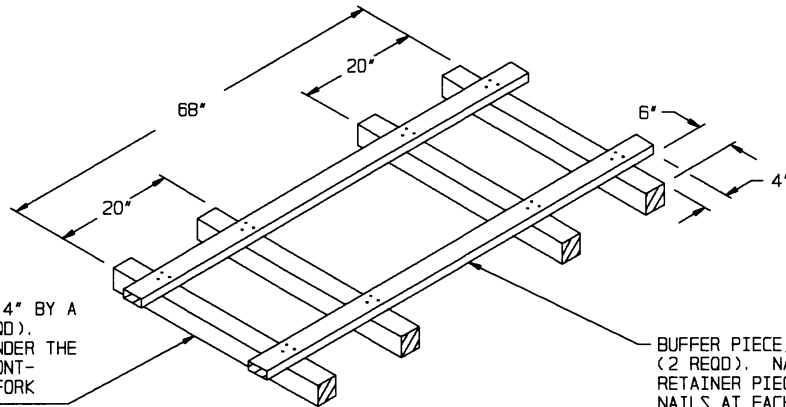
### REAR BLOCKING ASSEMBLY A

THIS ASSEMBLY IS DESIGNED FOR USE AT THE REAR OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOOR IS MORE THAN 9".



### REAR BLOCKING ASSEMBLY B

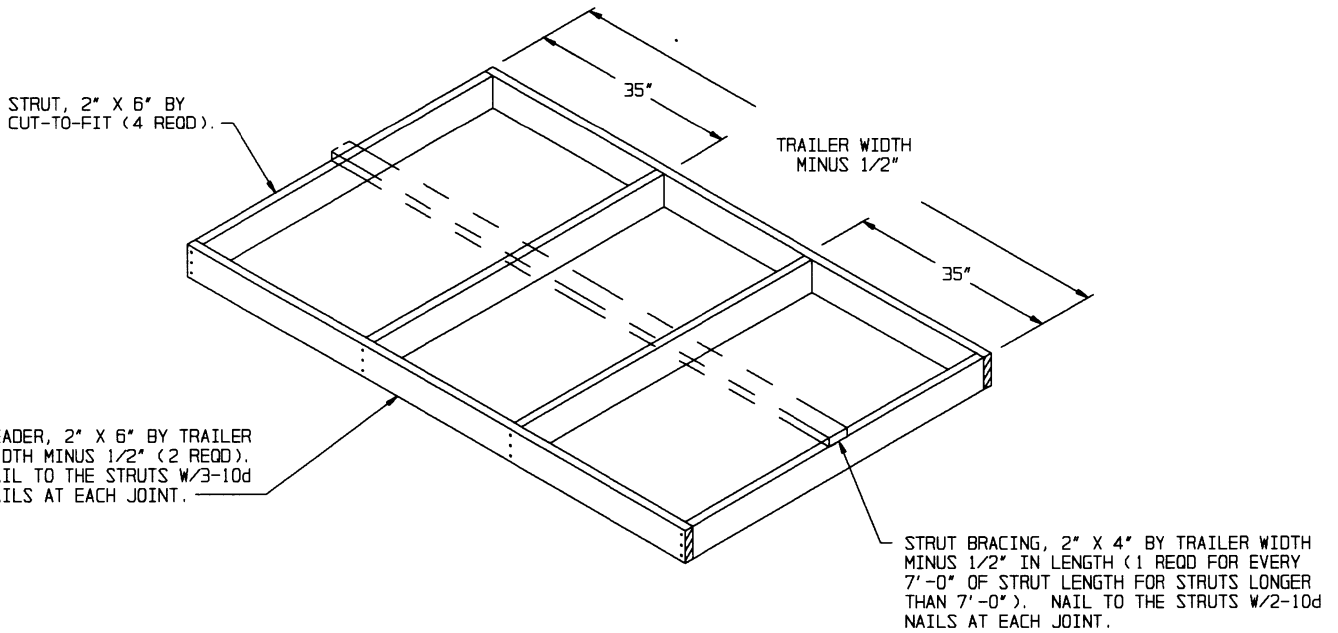
THIS ASSEMBLY IS DESIGNED FOR USE AT THE REAR OF A LOAD WHEN THE SPACE BETWEEN THE LADING AND THE TRAILER DOOR IS GREATER THAN 1-1/2" BUT LESS THAN 9".



RETAINER PIECE, 4" X 4" BY A LENGTH TO SUIT (4 REQD). POSITION TO EXTEND UNDER THE LATERALLY ADJACENT CONTAINERS AND THRU THE FORK TINE OPENINGS.

BUFFER PIECE, 2" X 4" X 6'-4" (2 REQD). NAIL TO THE RETAINER PIECES W/3-12d NAILS AT EACH JOINT.

**ANTI-SWAY BRACE**



STRUT, 2" X 6" BY CUT-TO-FIT (4 REQD).

TRAILER WIDTH MINUS 1/2"

HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

STRUT BRACING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (1 REQD FOR EVERY 7'-0" OF STRUT LENGTH FOR STRUTS LONGER THAN 7'-0"). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

**SPACER ASSEMBLY**

