LOADING AND BRACING (TL & LTL) IN VAN TRAILERS● OF BOMB, 2,000 LB, MK84 ON MK79 PALLETS

INDEX

● **CAUTION: MK84 BOMBS MUST ONLY BE SHIPPED BY FLATBED TRAILERS IN ACCORDANCE WITH NAVSEA DRAWING 6214078, UNLESS IT IS OF MILITARY NECESSITY TO SHIP BY VAN TRAILER. THIS DOCUMENT INCLUDES OUTLOADING PROCEDURES FOR CONVENTIONAL TYPE TRAILERS. 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 FIELD SUPPORT COMMAND

APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND

U.S. ARMY DEFENSE AMMUNITION CENTER

CAUTION: VERIFY PRIOR TO USE AT WWW.DAC.ARMY.MIL THAT THIS IS THE MOST CURRENT VERSION OF THIS DOCUMENT. THIS IS PAGE 1 OF 16.

DO NOT SCALE

JULY 1992

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REVISION NO. 1 — **OCTOBER 2005**

SEE THE REVISION LISTING ON PAGE 2

CLASS	DIVISION	DRAWING	FILE
19	48	4263	11PB1004

PROJECT CA 274-91

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 MK84 2,000 POUND BOMBS ON MK79 PALLET. FOR DETAIL OF THE PALLET UNIT, SEE NAVAL SEA SYSTEMS COMMAND DRAWING 6214081 AND PAGE 3. THE LOADING OF MK79 PALLET UNITS IN A VAN TRAILER IS DIFFICULT DUE TO THE WEIGHT AND LIMITATIONS OF MHE WHEN END LOADING THE PALLET UNITS. THE PREFERRED METHOD OF HIGHWAY TRANSPORT IS VIA FLATBED TRAILER IN ACCORDANCE WITH NAVAL SEA SYSTEMS COMMAND DRAWING 6214078, HOWEVER, THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE WHEN IT IS OF MILITARY NECESSITY TO SHIP BY VAN TRAILER.

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 FOR THE TRANSPORT OF THE DESIGNATED ITEM IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY VEHICLES IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS WILL BE SELECTED FOR USE.

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 PALLET UNITS OF ROCKETS, 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.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER - - - - - - - -:	SEE TM 743-200-1 (DUNNAGE LUMBER) AND VOLUNTARY PRODUCT STANDARD PS 20.
NAILS - - - - - - - -:	ASTM F1667; COMMON STEEL NAIL (NLCMS OR NLCMMS).
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.
WIRE, CARBON STEEL - - - -:	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, 0.0800" DIA, GRADE 1006 OR BETTER.

(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 INSTALL AN ADDITIONAL SEPARATOR GATE, PIECE MARKED ③, AGAINST FORWARD PORTION OF THE TRAILER.

K. 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 25.4MM AND ONE POUND EQUALS 0.454 KG.

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 3 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.

N. 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.

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 ASTM F1667 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. 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.

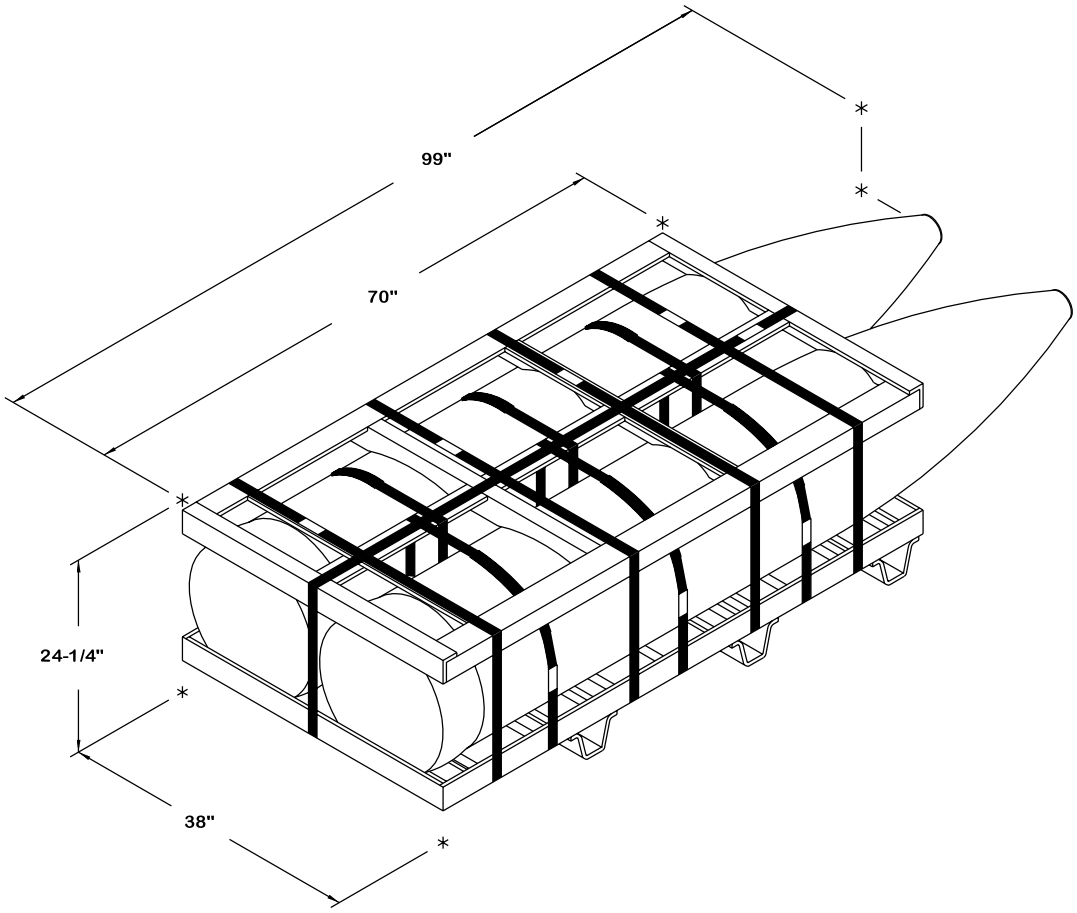
Q. PORTIONS OF THE TRAILERS, SUCH AS SIDEWALLS, ENDWALLS, AND ROOFS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.

R. 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 THAN 9", USE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 13. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN ON PAGE 13. NOTE: REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. CAUTION: THE NAILED HEADER METHOD IS REQUIRED WHEN LOADING TRAILERS EQUIPPED WITH ROLL UP TYPE DOORS.

REVISION

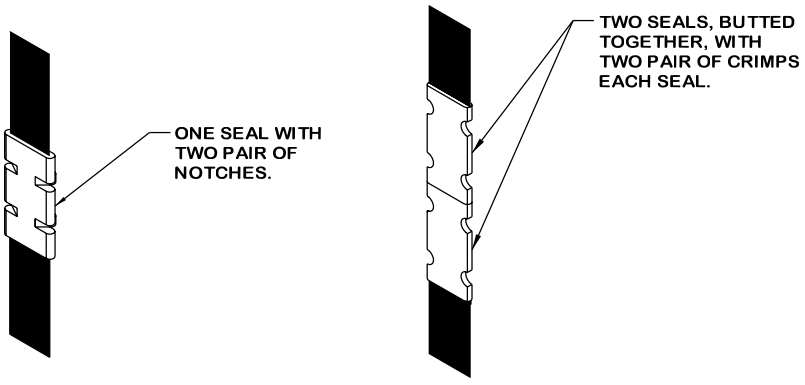
REVISION NO. 1, DATED OCTOBER 2005, CONSISTS OF:

1. ADDING CAUTION NOTE TO COVER PAGE FOR MOVEMENT BY FLATBED TRAILER.
2. UPDATING DRAWING NOTES.
3. REVISING DRAWING FORMAT.



PALLET UNIT

BOMB - - - - - - - - - - - - - 2 EACH @ 1,930 LBS (APPROX)
CUBE - - - - - - - - - - - - - 55.5 CUBIC FT (APPROX)
GROSS WEIGHT - - - - - - - - - 4,133 LBS (APPROX)



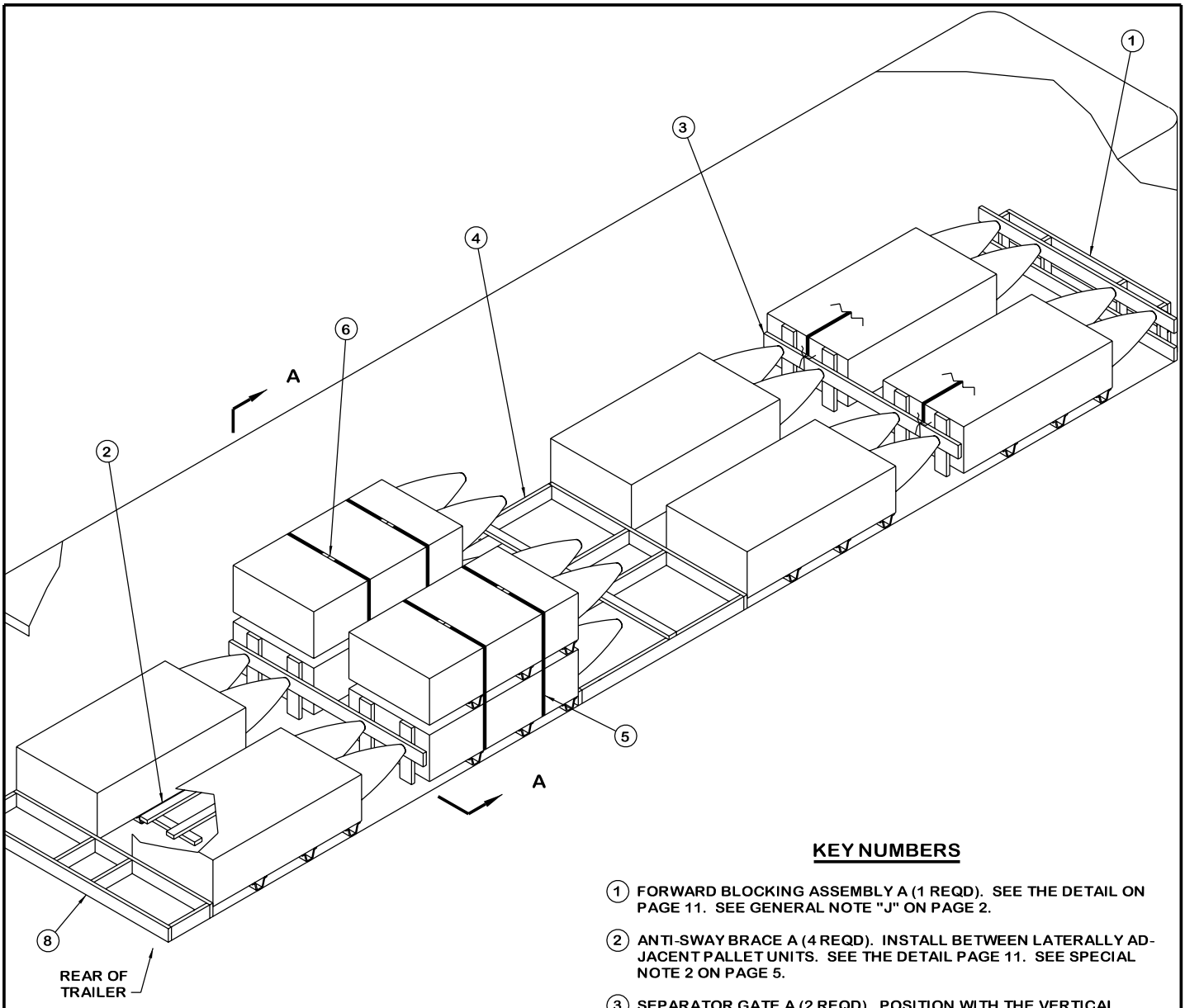
STRAP JOINT A

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.

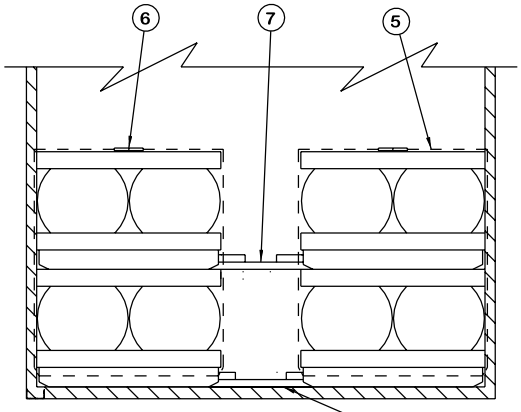
END-OVER-END LAP JOINT DETAILS



ISOMETRIC VIEW

KEY NUMBERS

1. FORWARD BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 11. SEE GENERAL NOTE "J" ON PAGE 2.
2. ANTI-SWAY BRACE A (4 REQD). INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE THE DETAIL PAGE 11. SEE SPECIAL NOTE 2 ON PAGE 5.
3. SEPARATOR GATE A (2 REQD). POSITION WITH THE VERTICAL PIECES AGAINST ALREADY LOADED UNITS. WIRE TIE TO ADJACENT PALLET LOAD STRAPS AS SHOWN IN THE LOAD VIEW ABOVE. SEE THE DETAIL ON PAGE 12.
4. SPACER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 12. SEE SPECIAL NOTE 3 ON PAGE 5.
5. STACK UNITIZING STRAP, 1-1/4" X .035" OR .031" X 15'-0" LONG STEEL STRAPPING (4 REQD). PREPOSITION, AND INSTALL TO ENCIRCLE A TOP LAYER PALLET UNIT AND THE UNIT DIRECTLY BELOW.
6. SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL.
7. ANTI-SWAY BRACE C (1 REQD). INSTALL BETWEEN LATERALLY ADJACENT TOP-LAYER PALLET UNITS. SEE THE DETAIL ON PAGE 14.
8. REAR BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 13 AND SPECIAL NOTE 4 ON PAGE 5.



SECTION A-A

10-UNIT LOAD IN A 40'-0" LONG BY 7'-8-1/2" WIDE VAN TRAILER

PROJECT CA 274-91

FORWARD HEADER NAILING CHART ●	
# NAILS	MAX. LOAD WEIGHT (LBS)
3	15,000
4	20,000
5	25,000
6	30,000
7	35,000
8	40,000
9	45,000

● HEADERS AT THE FRONT END OF A LOAD OR AT THE FRONT END OF A DIVIDED LOAD WILL BE DOUBLED 2" X 6" MATERIAL. THE NUMBER OF NAILS INDICATED ABOVE REFERS TO THE NUMBER OF NAILS USED IN EACH LAMINATION OF A HEADER, FOR EXAMPLE 8 NAILS MEANS THE FIRST BOARD IS NAILED TO THE TRAILER FLOOR W/8-10d NAILS, AND THE SECOND BOARD IS LAMINATED TO THE FIRST W/8-20d NAILS, FOR A TOTAL OF 8-10d AND 8-20d NAILS PER HEADER.

REAR HEADER NAILING CHART *	
# NAILS	MAX. LOAD WEIGHT (LBS)
6	15,000
7	17,500
8	20,000
9	22,500
10	25,000
11	27,500
12	30,000
13	32,500
14	35,000
15	37,500
16	40,000
17	42,500
18	45,000

* HEADERS AT THE REAR OF A FULL LOAD OR AT THE REAR END OF A DIVIDED LOAD WILL BE DOUBLED 2" X 4" MATERIAL. THE NUMBER OF NAILS INDICATED ABOVE REFERS TO THE NUMBER OF NAILS USED IN EACH LAMINATION OF A HEADER, FOR EXAMPLE 8 NAILS MEANS THE FIRST BOARD IS NAILED TO THE TRAILER FLOOR W/8-10d NAILS, AND THE SECOND BOARD IS LAMINATED TO THE FIRST W/8-10d NAILS, FOR A TOTAL OF 16-10d NAILS. NOTE: REAR HEADERS MAY BE HANDLED IN THE SAME MANNER AS FORWARD HEADERS, USING 2" X 6" MATERIAL WITH 10d AND 20d NAILS, IF DESIRED.

SPECIAL NOTES:

1. A 10-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-8-1/2" WIDE (INSIDE DIMENSION) VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.
2. IF THERE IS NOT ENOUGH SPACE FOR THE NAILING OF ANTI-SWAY BRACE, PIECE MARKED ②, "ANTI-SWAY BRACE B" DETAILED ON PAGE 14 MAY BE PREFABRICATED AND POSITIONED ON THE FLOOR BETWEEN LATERALLY ADJACENT PALLET UNITS.
3. THE SPACER ASSEMBLY, SHOWN AS PIECE MARKED ④IN 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'-0", 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: A SPACER ASSEMBLY 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.
4. 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 THAN 9", USE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 13. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN ON PAGE 13. NOTE: REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. SEE THE NAILED HEADER METHOD DETAILED ON PAGE 15 AND THE HEADER NAILING CHARTS AT LEFT. CAUTION: THE NAILED HEADER METHOD IS REQUIRED WHEN LOADING TRAILERS EQUIPPED WITH ROLL UP TYPE DOORS.
5. THE STACK UNITIZING STRAPS, PIECE MARKED ⑥IN THE LOAD ON PAGE 4, WILL BE INSTALLED TO SECURE AN UNSUPPORTED PALLET UNIT IN THE SECOND LAYER TO A CORRESPONDING UNIT IN THE FIRST LAYER, EXCEPT AT THE VERY REAR OF THE LOAD.
6. FOR SHIPMENT OF LESS THAN FULL LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 8 THRU 10.

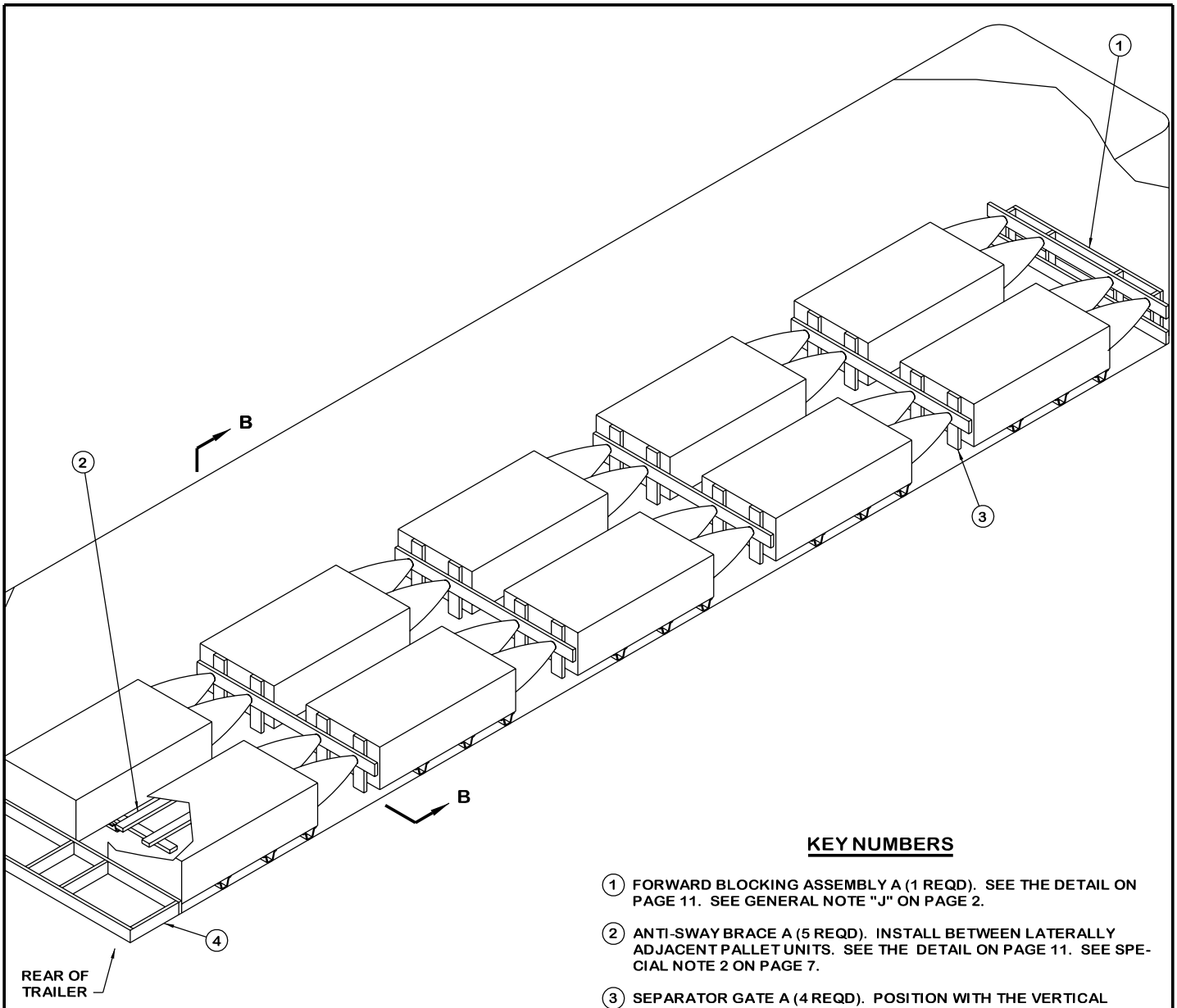
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	67 130	45 130
NAILS	NO. REQD	POUNDS
10d (3")	178	2-3/4
STEEL STRAPPING, 1-1/4" - - 60' REQD - - - - 9 LBS SEAL FOR 1-1/4" STRAPPING - - 8 REQD - - - - - NIL WIRE, .0800" DIA - - - - - - 12' REQD - - - - - NIL		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	10	41,330 LBS
DUNNAGE		362 LBS
TOTAL WEIGHT		41,692 LBS (APPROX)

10-UNIT LOAD IN A 40'-0" LONG BY 7'-8-1/2" WIDE VAN TRAILER

PROJECT CA 274-91



ISOMETRIC VIEW

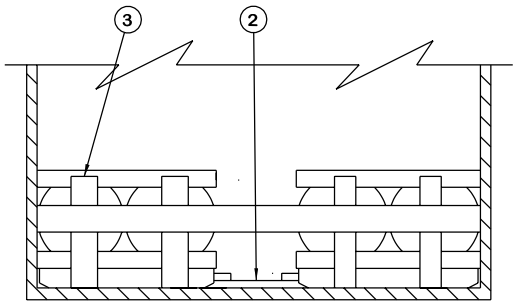
KEY NUMBERS

(1) FORWARD BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 11. SEE GENERAL NOTE "J" ON PAGE 2.

(2) ANTI-SWAY BRACE A (5 REQD). INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE THE DETAIL ON PAGE 11. SEE SPECIAL NOTE 2 ON PAGE 7.

(3) SEPARATOR GATE A (4 REQD). POSITION WITH THE VERTICAL PIECES AGAINST ALREADY LOADED UNITS. WIRE TIE TO ADJACENT PALLET LOAD STRAPS AS SHOWN IN THE LOAD VIEW ABOVE. SEE THE DETAIL ON PAGE 12.

(4) REAR BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 13 AND SPECIAL NOTE 4 ON PAGE 7.



SECTION B-B

10-UNIT LOAD IN A 45'-0" LONG BY 7'-8-1/2" WIDE VAN TRAILER

SPECIAL NOTES:

1. A 10-UNIT LOAD IS SHOWN IN A 45'-0" LONG BY 7'-8-1/2" WIDE (INSIDE DIMENSION) VAN TRAILER. TRAILERS OF OTHER DIMENSIONS CAN BE USED.

2. IF THERE IS NOT ENOUGH SPACE FOR THE NAILING OF ANTI-SWAY BRACE, PIECE MARKED ②, "ANTI-SWAY BRACE B" DETAILED ON PAGE 14 MAY BE PREFABRICATED AND POSITIONED ON THE FLOOR BETWEEN LATERALLY ADJACENT PALLET UNITS.

3. THE SPACER ASSEMBLY, SHOWN AS PIECE MARKED ④IN THE LOAD ON PAGE 4, IS USED FOR THE PURPOSE OF PROVIDING FOR PROPER WEIGHT DISTRIBUTION. NOTE: THE ASSEMBLY MAY ALSO BE USED IN THE PLACE OF TWO OMITTED PALLET UNITS IN THE LOAD SHOWN ON PAGE 6. NOTE: 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.

4. 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 THAN 9", USE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 13. IF THE VOID AT THE REAR OF THE LOAD IS 9" OR GREATER, USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN ON PAGE 13. NOTE: REAR BLOCKING ASSEMBLIES MAY BE REPLACED WITH NAILED HEADERS AT THE REAR OF THE LOAD, PROVIDED THE TRAILER IS CONFIGURED SUCH AS TO ALLOW NAILING IN THE AREA IN QUESTION. SEE THE NAILED HEADER METHOD DETAILED ON PAGE 15 AND THE HEADER NAILING CHARTS ON PAGE 5. CAUTION: THE NAILED HEADER METHOD IS REQUIRED WHEN LOADING TRAILERS EQUIPPED WITH ROLL UP TYPE DOORS.

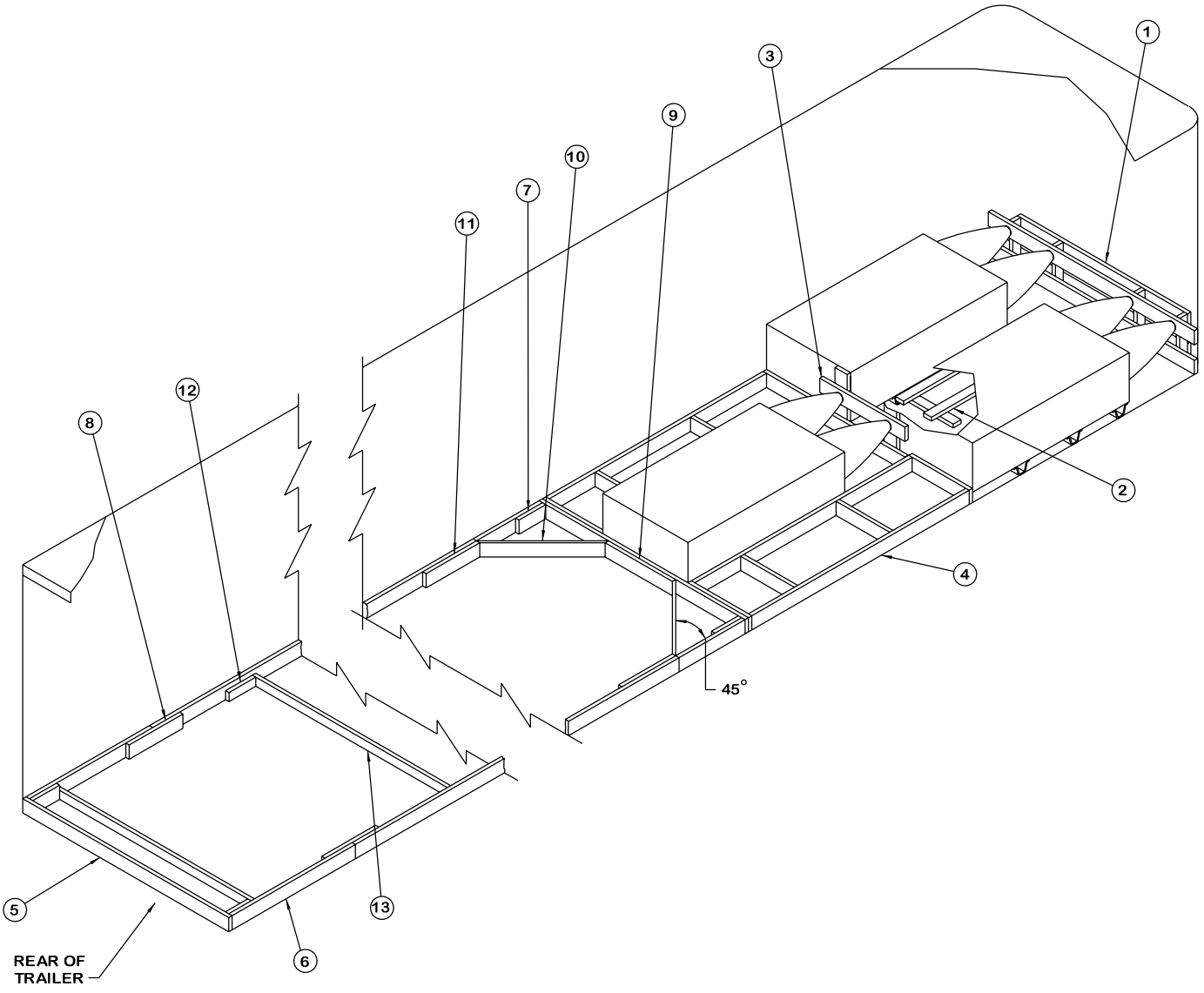
5. FOR SHIPMENT OF LESS THAN FULL LOADS, REFER TO THE APPLICABLE GUIDANCE ON PAGES 8 THRU 10.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	72 111	48 111
NAILS	NO. REQD	POUNDS
10d (3")	170	2-3/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	10	41,330 LBS
DUNNAGE		321 LBS
TOTAL WEIGHT		41,651 LBS (APPROX)

10-UNIT LOAD IN A 45'-0" LONG BY 7'-8-1/2" WIDE VAN TRAILER



ISOMETRIC VIEW

KEY NUMBERS

(KEY NUMBERS CONTINUED)

(9) CENTER CLEAT, 2" X 6" X 30" (1 REQD). NAIL TO A HEADER, PIECE MARKED (5), W/6-10d NAILS.

(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 4 ON PAGE 9.

(13) STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" IN LENGTH (MINIMUM OF ONE REQD). 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 4 ON PAGE 9.

(1) FORWARD BLOCKING ASSEMBLY A (1 REQD). SEE THE DETAIL ON PAGE 11. SEE GENERAL NOTE "J" ON PAGE 2.

(2) ANTI-SWAY BRACE A (2 REQD). POSITION BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE THE DETAIL ON PAGE 11.

(3) SEPARATOR GATE B (1 REQD). SEE THE DETAIL ON PAGE 9.

(4) SIDE BLOCKING (2 REQD). SEE THE DETAIL ON PAGE 14. NAIL TO A HEADER, PIECE MARKED (5), W/2-10d NAILS. SEE SPECIAL NOTE 2 ON PAGE 9.

(5) HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" IN LENGTH (2 REQD). SEE SPECIAL NOTES 6 AND 7 ON PAGE 9.

(6) SIDE STRUT, 2" X 6" BY CUT TO FIT BETWEEN THE FORWARD AND REAR HEADERS, PIECE MARKED (5) (2 REQD). SEE SPECIAL NOTE 3 ON PAGE 9.

(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/2-12d NAILS.

(8) SPLICE PIECE, 2" X 6" X 24" (AS REQD). CENTER ON JOINT OF PIECES MARKED (6) AND NAIL TO SIDE STRUT MARKED (6) W/4-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 9.

(CONTINUED AT LEFT)

TYPICAL LTL (3-UNIT LOAD) IN A VAN TRAILER

SPECIAL NOTES:

1. A 7'-8" WIDE (INSIDE DIMENSION) VAN TRAILER IS SHOWN. TRAILERS OF OTHER DIMENSIONS CAN BE USED.

2. THE SIDE BLOCKING, PIECES MARKED ④, ARE SHOWN ONLY TO DEPICT A TYPICAL INSTALLATION. SIDE BLOCKING 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.

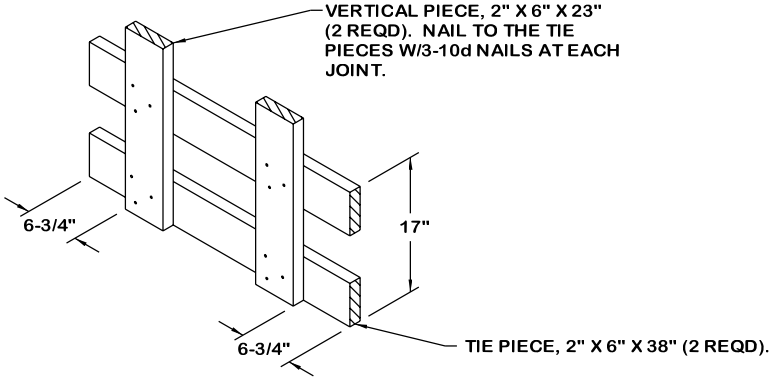
3. DEPENDING ON THE NUMBER OF UNITS BEING LOADED, EACH OF THE SIDE STRUTS, PIECES MARKED ⑥, MAY NEED TO BE FORMED FROM MORE THAN ONE PIECE OF MATERIAL. IF SUCH IS THE CASE, THE SIDE STRUTS MUST BE SPLICED. SPLICING CAN BE ACCOMPLISHED BY CENTERING A 2" X 6" X 24" PIECE ON THE JOINT OF THE SIDE STRUTS AND NAILING IT TO THE SIDE STRUTS W/4-10d NAILS AT EACH END. IF DESIRED, THE STRUT BRACING PIECE(S), PIECE MARKED ⑬ MAY BE NAILED TO THE SPLICE PIECES IN LIEU OF USING ADDITIONAL STRUT BRACE RETAINING CLEATS, PIECES MARKED ⑫.

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, PIECES MARKED ⑥ ARE LONGER THAN 7'-0" AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑬, AND TWO STRUT BRACE RETAINING CLEATS, PIECES MARKED ⑫, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.

5. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED ⑤ THRU ⑬ IS ADEQUATE FOR RETAINING A MAXIMUM LTL LOAD OF 20,000 POUNDS.

6. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, SPECIAL REAR BLOCKING MUST BE INSTALLED IN LIEU OF THE "K-BRACE" TYPE BLOCKING. SEE THE "NAILED HEADER METHOD" 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, AND MAY BE USED IN LIEU OF PIECES MARKED ⑤ THRU ⑬ WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS.

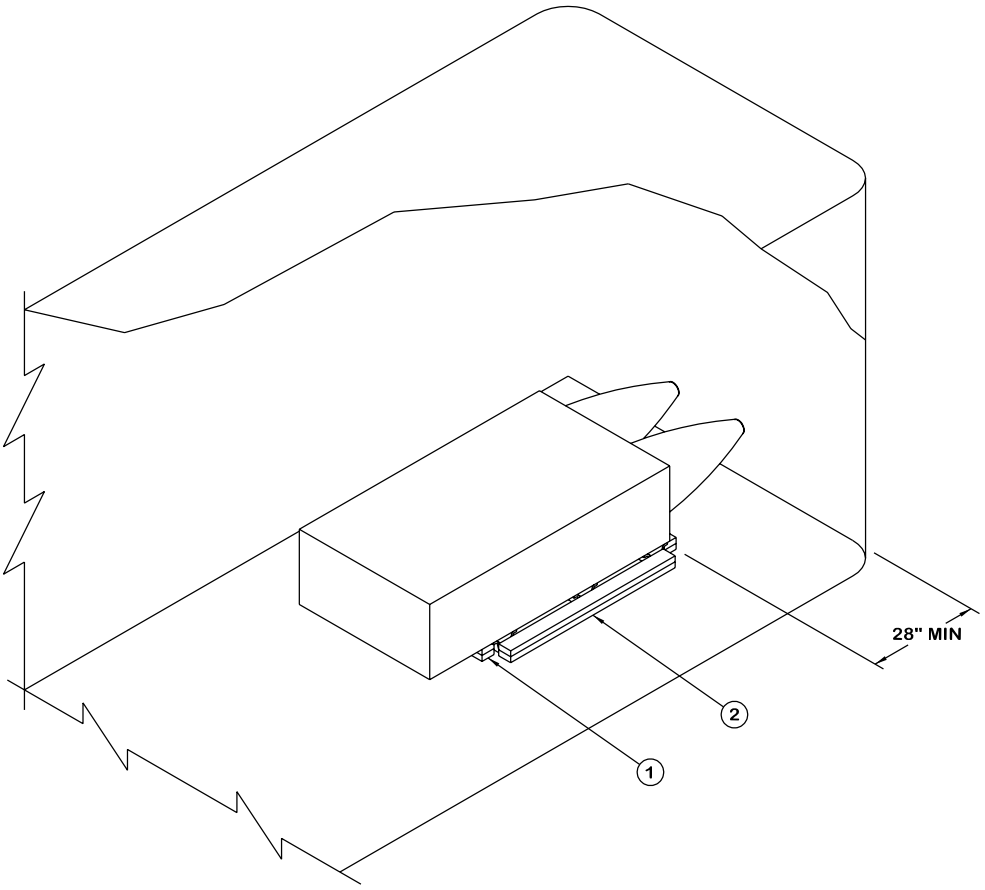
7. IF DESIRED, IN TRAILERS EQUIPPED WITH NAILABLE FLOORS. THE NAILED HEADER METHOD OF REAR BLOCKING MAY BE USED IN LIEU OF THE K-BRACE BLOCKING SHOWN ON PAGE 9. REFER TO THE NAILED HEADER METHOD DETAILED ON PAGE 15 AND THE HEADER NAILING CHARTS ON PAGE 5.



SEPARATOR GATE B

ROTATE GATE 180° TO INSTALL.

TYPICAL LTL (3-UNIT LOAD) IN A VAN TRAILER



ISOMETRIC VIEW

SPECIAL NOTES:

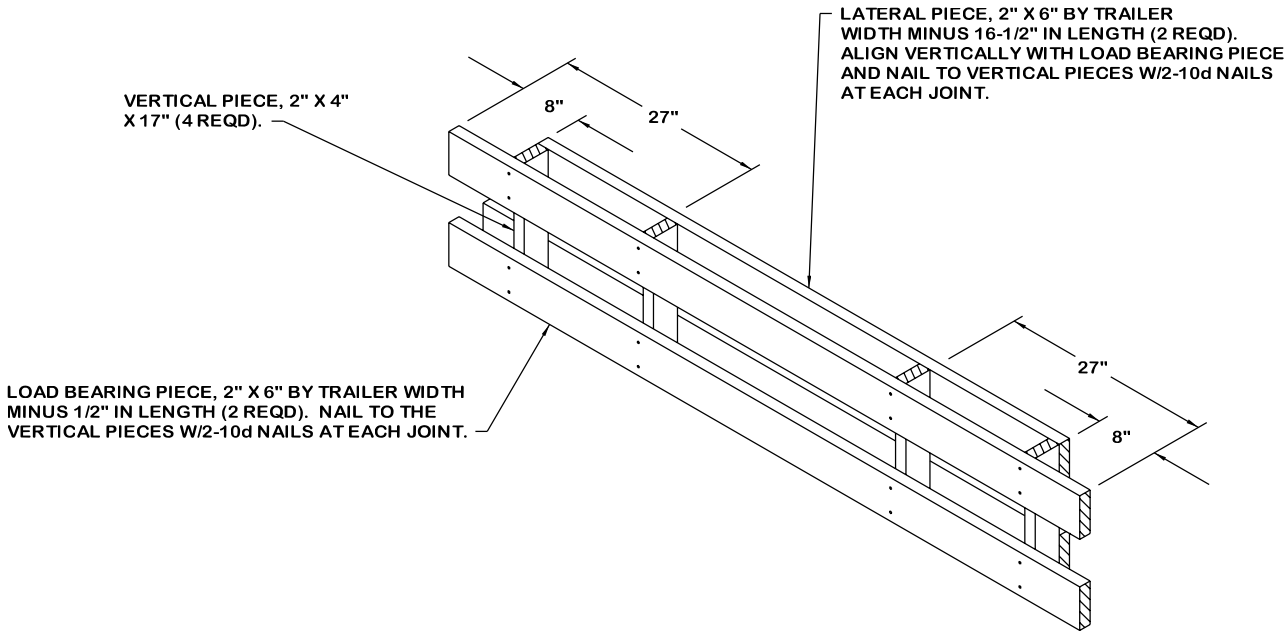
1. A 7'-6" WIDE (INSIDE DIMENSION) TRAILER WHICH HAS A NAILABLE FLOOR IS SHOWN. TRAILERS OF OTHER WIDTHS CAN BE USED.
2. A TYPICAL LTL LOAD OF ONE PALLET UNIT IS SHOWN. NOTE: ONE UNIT MUST BE CENTERED ACROSS THE WIDTH OF THE TRAILER.
3. MORE THAN ONE UNIT CAN BE SHIPPED. THE LOAD SHOULD BE FORMED IN ROWS, WITH THE UNITS POSITIONED AGAINST OPPOSITE SIDEWALLS. THE ANTI-SWAY BRACE, PIECE MARKED (2) IN THE LOADS ON PAGES 4 AND 6 MUST BE INSTALLED BETWEEN THE LATERALLY ADJACENT UNITS. SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 11. CAUTION: THE END BLOCKING, PIECE MARKED (1), WILL NOT BE RELIED UPON TO RETAIN A LOAD OF OVER 5,000 POUNDS.

KEY NUMBERS

(1) END BLOCKING, 2" X 4" X 36" (DOUBLED) (2 REQD). PREPOSITION 48" APART (APPROX). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

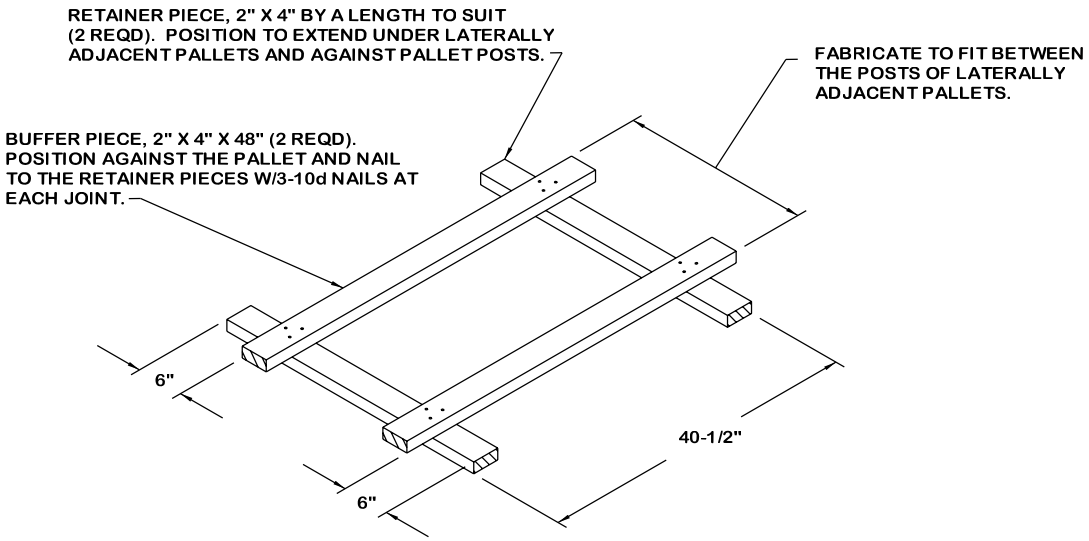
(2) SIDE BLOCKING, 2" X 4" X 48" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

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



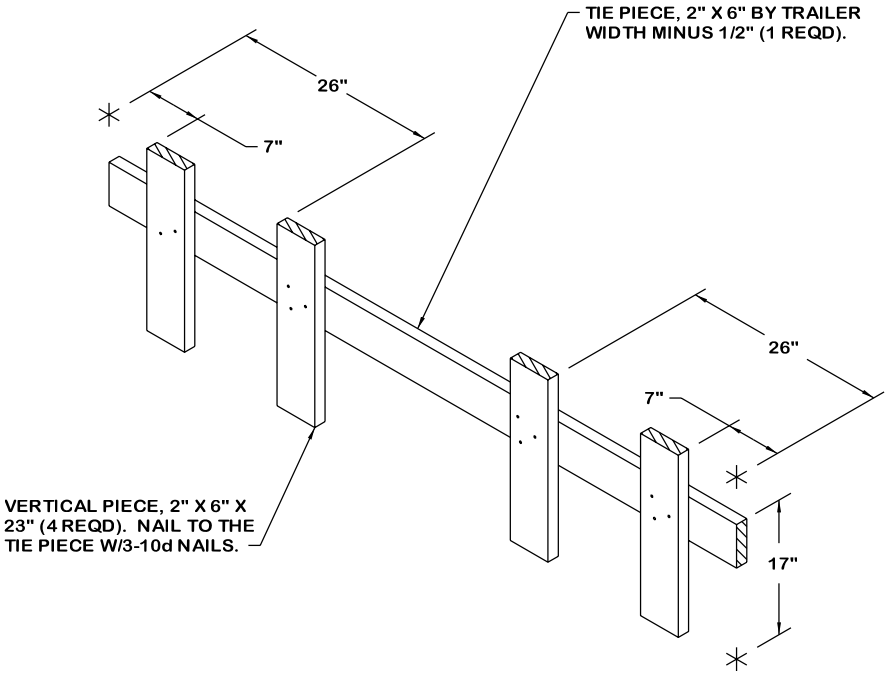
FORWARD BLOCKING ASSEMBLY A

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 THE 2" X 4" PIECES. IF THE TRAILER TO BE LOADED HAS LARGE-ANGLED CORNERS AT THE FORWARD END, REFER TO PAGE 16 FOR GUIDANCE.



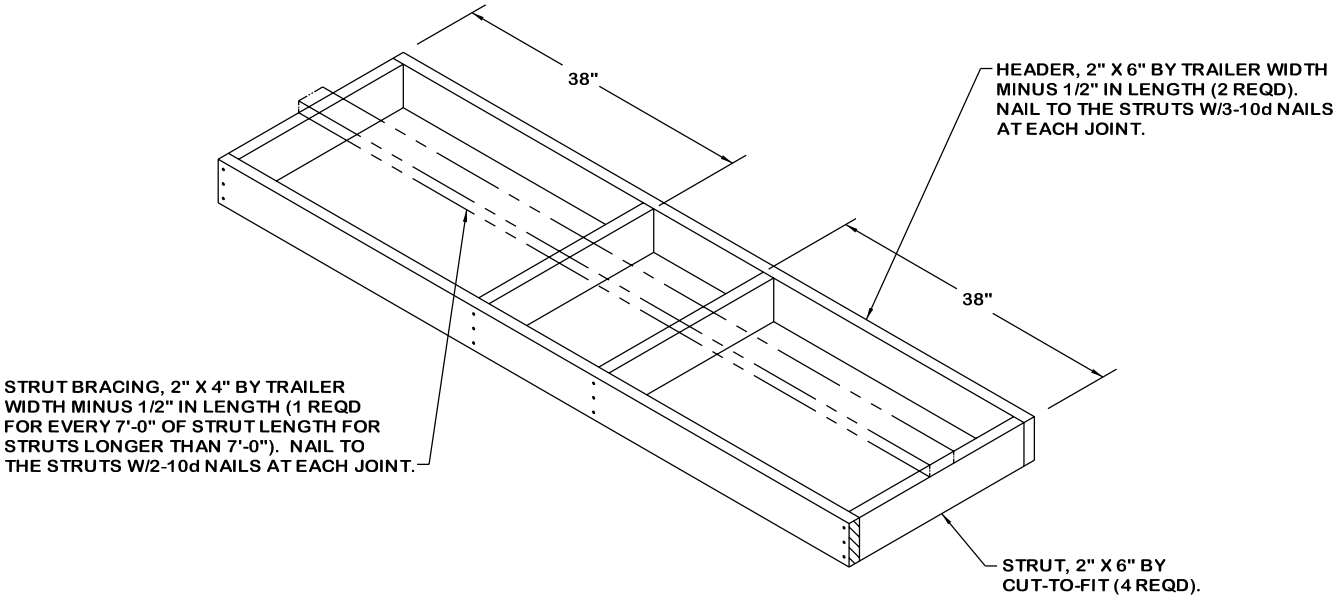
ANTI-SWAY BRACE A

IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED, ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN BE INSTALLED INTO THE FORKLIFT OPENING OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET.



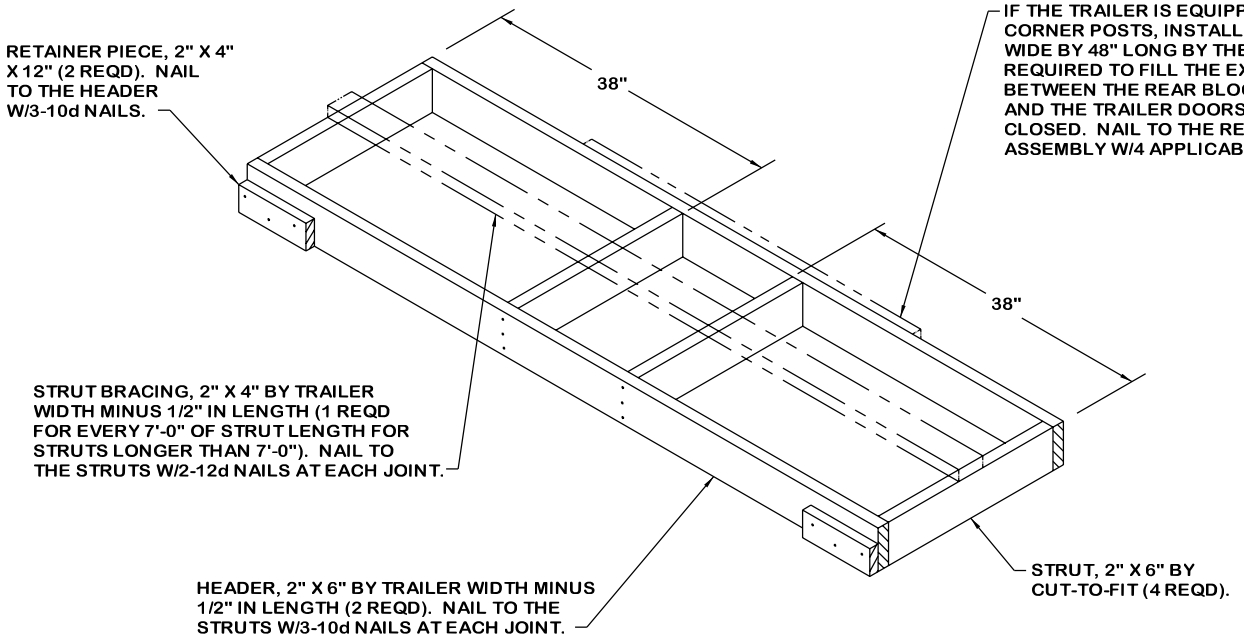
SEPARATOR GATE A

ROTATE GATE 180° TO INSTALL.



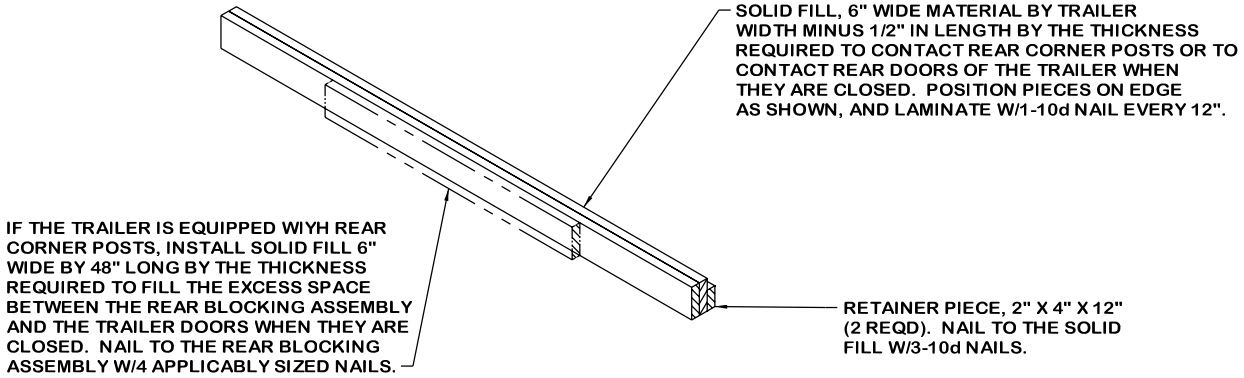
SPACER ASSEMBLY

PROJECT CA 274-91



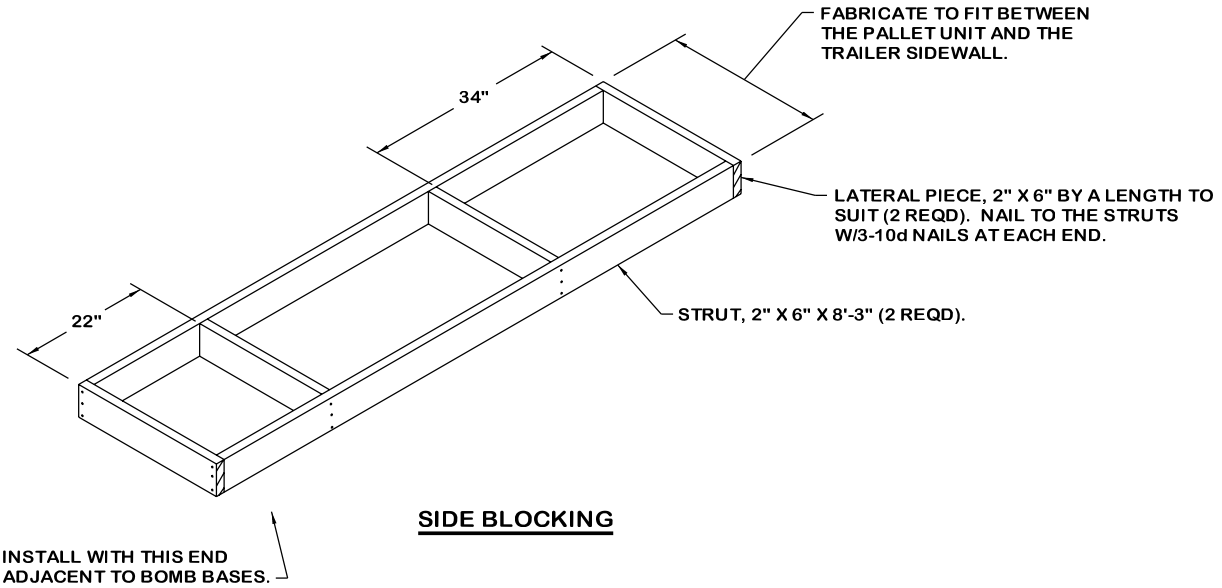
REAR BLOCKING ASSEMBLY A

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

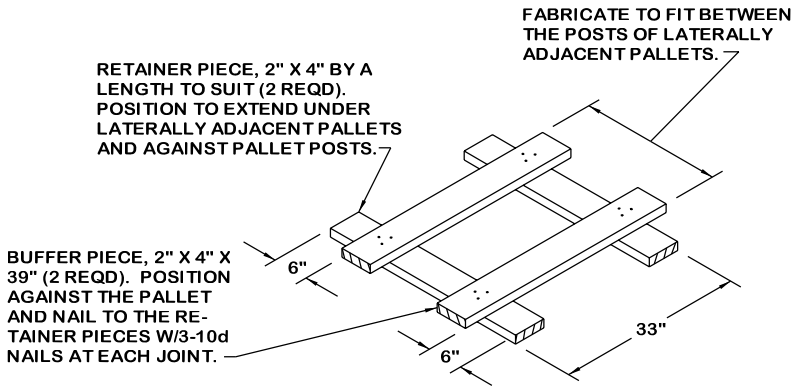


REAR BLOCKING ASSEMBLY B

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".

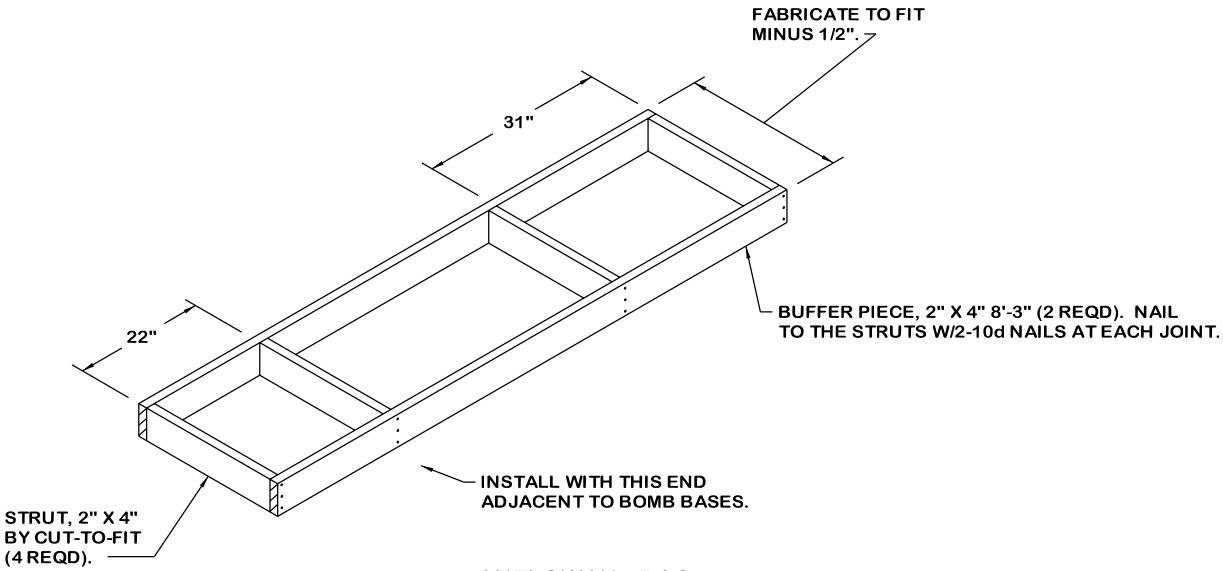


SIDE BLOCKING



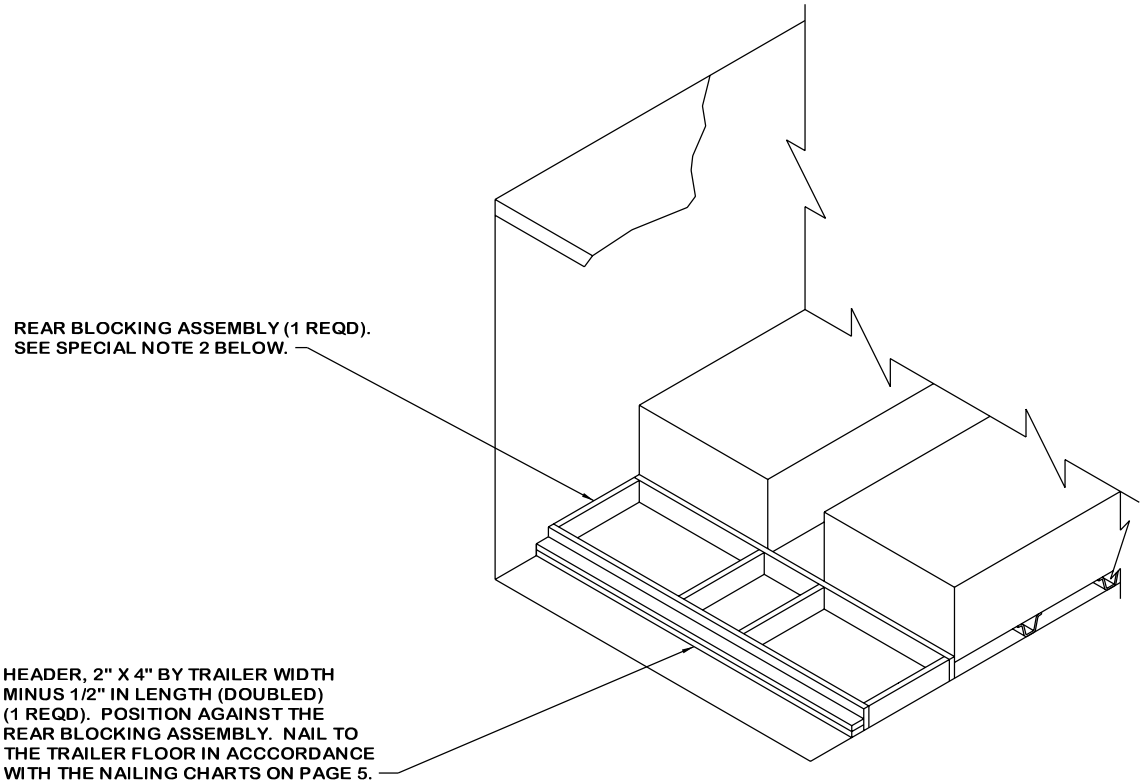
ANTI-SWAY BRACE C

THIS ASSEMBLY IS FOR USE BETWEEN TOP LAYER UNITS.



ANTI-SWAY BRACE B

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" SPACE IS PERMITTED.



NAILED HEADER METHOD

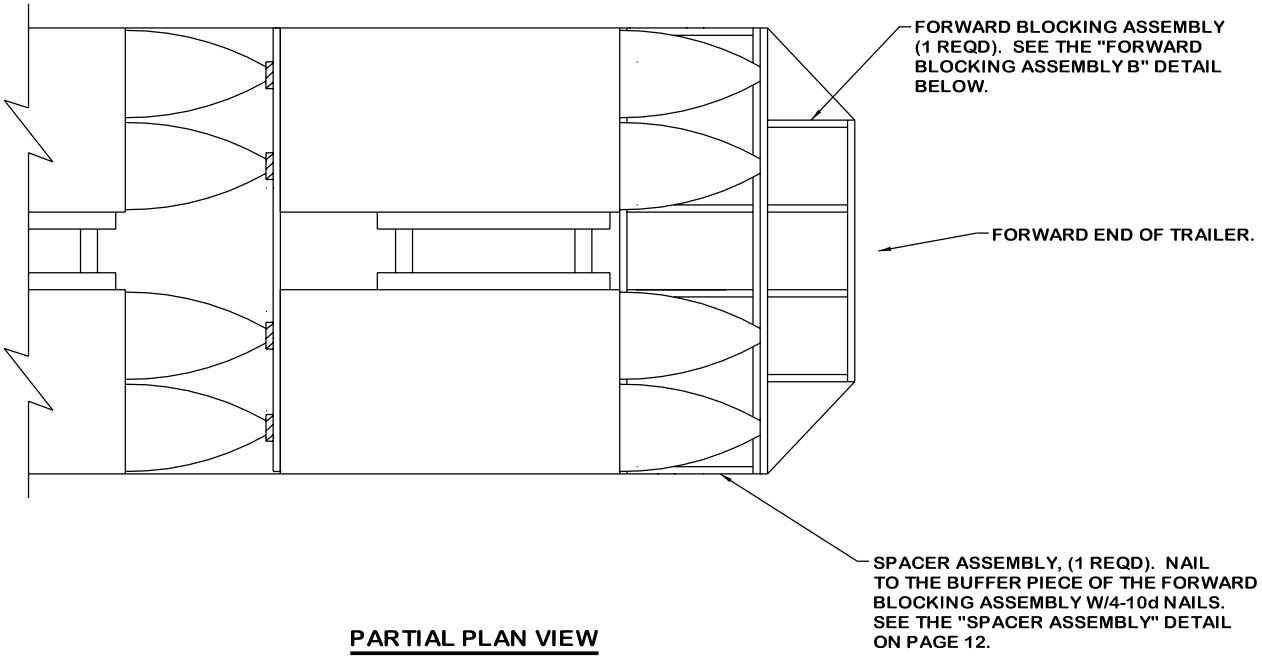
SPECIAL NOTES:

1. 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. REAR BLOCKING ASSEMBLY "A" IS SHOWN FOR A TYPICAL INSTALLATION. CONSTRUCT THE ASSEMBLY USING 6" (MINIMUM) LONG STRUTS.

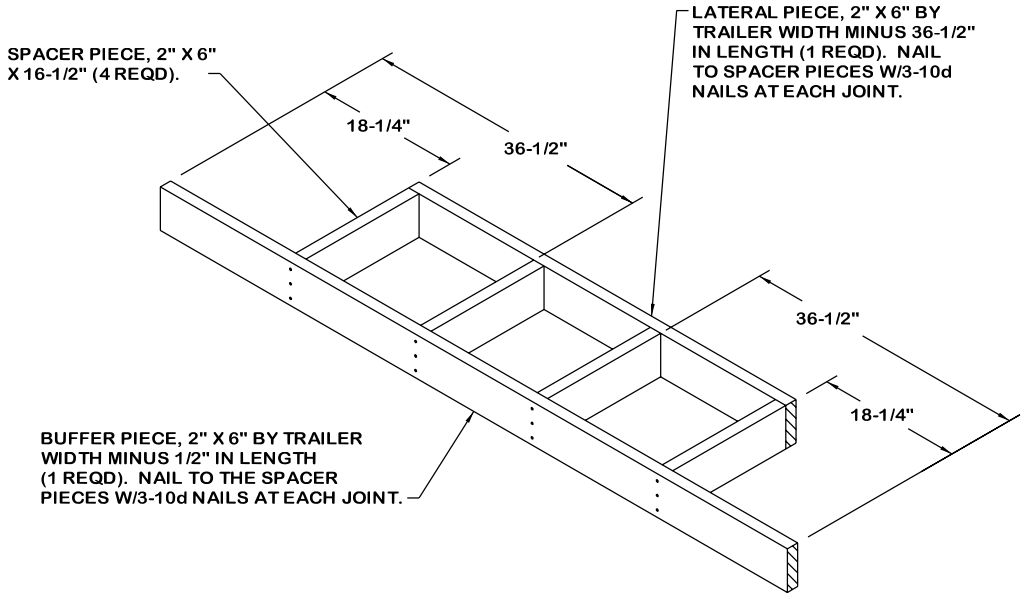
3. THE NAILED-HEADER METHOD OF REAR BLOCKING IS ADEQUATE FOR THE RETENTION OF THE MAXIMUM WEIGHT LOAD.

4. THE NAILED- HEADER METHOD, ALTHOUGH DESIGNED ESPECIALLY FOR TRAILERS HAVING ROLL-UP TYPE DOORS, MAY ALSO BE USED IN TRAILERS EQUIPPED WITH HINGED DOORS.



PARTIAL PLAN VIEW

NOTE: THE STRUTS ON THE SPACER ASSEMBLY ABOVE ARE 18" LONG; FOR TRAILERS HAVING ROUNDED CORNERS OR ANGLED CORNERS OF ANOTHER SIZE, ADJUST THE STRUT LENGTH SO THAT THE NOSE OF THE BOMB IS AT LEAST 3" FROM THE FRONT WALL OF THE TRAILER.



FORWARD BLOCKING ASSEMBLY B