LOADING AND BRACING (TL & LTL) IN VAN TRAILERS⊕ OF MK20 (ROCKEYE II) OR CBU-59/B (APAM) DISPENSER AND BOMB, AIRCRAFT, PACKED IN CNU-238/E SHIPPING AND STORAGE CONTAINER

INDEX

ITEM	PAGE(S)
GENERAL NOTES AND MATERIAL SPECIFICATIONS	2
UNITIZING AND HANDLING GUIDANCE	3
19-UNIT LOAD IN A 45'-0" LONG BY 8'-2" WIDE VAN TRAILER	4,5
19-UNIT LOAD IN A 40'-0" LONG BY 7'-8" WIDE VAN TRAILER	6,7
TYPICAL LTL (2-UNIT LOAD)	8,9
TYPICAL LTL (1-UNIT LOAD)	10
DETAILS	11-13

⊕ CAUTION: THE OUTLOADING PROCEDURES SHOWN HEREIN ARE ONLY APPLICABLE TO HIGHWAY MOVEMENTS, NOT TRAILER-ON-FLATCAR MOVEMENTS.

DO NOT SCALE

U.S. ARMY MATERIEL COMMAND DRAWING

APPROVED, U.S. ARMY INDUSTRIAL OPERATIONS COMMAND

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

U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

DRAFTSMAN	TECHNICIAN	ENGINEER
M. SARDONE		

VALIDATION ENGINEERING DIVISION	TRANSPORTATION ENGINEERING DIVISION	LOGISTICS ENGINEERING OFFICE

MARCH 1996

CLASS	DIVISION	DRAWING	FILE
19	48	8522	SP11J17

PROJECT SP 224-92

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 FOR MK20 (ROCKEY II) OR CBU-59/E (APAM) DISPENSER AND BOMB PACKED IN CNU-238/E CONTAINERS. SUBSEQUENT REFERENCE TO THE CONTIANER HEREIN MEANS THE CNU-238/E CONTAINER WITH AMMUNITION ITEMS.

CONTAINER DIMENSIONS - 104" L X 38" W X 26" H
CONTAINER WEIGHT - - - 2,157 LBS (APPROX)
CONTAINER CUBE - - - - 59.5 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. VAN TRAILERS WHICH ARE 40'-0" LONG BY 7'-8' WIDE (INSIDE DIMENSION) AND 45'-0" LONG BY 8'-2" 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 SPECIFIED BRACING IS ADEQUATE FOR LOADS WEIGHING UP TO AND INCLUDINGTHE 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 OFF 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 THROUGH 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 THE 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 HEAVIER LOADS 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 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.

J. 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 12 FOR GUIDANCE.

K. 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.

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

L. 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.

M. 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.

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

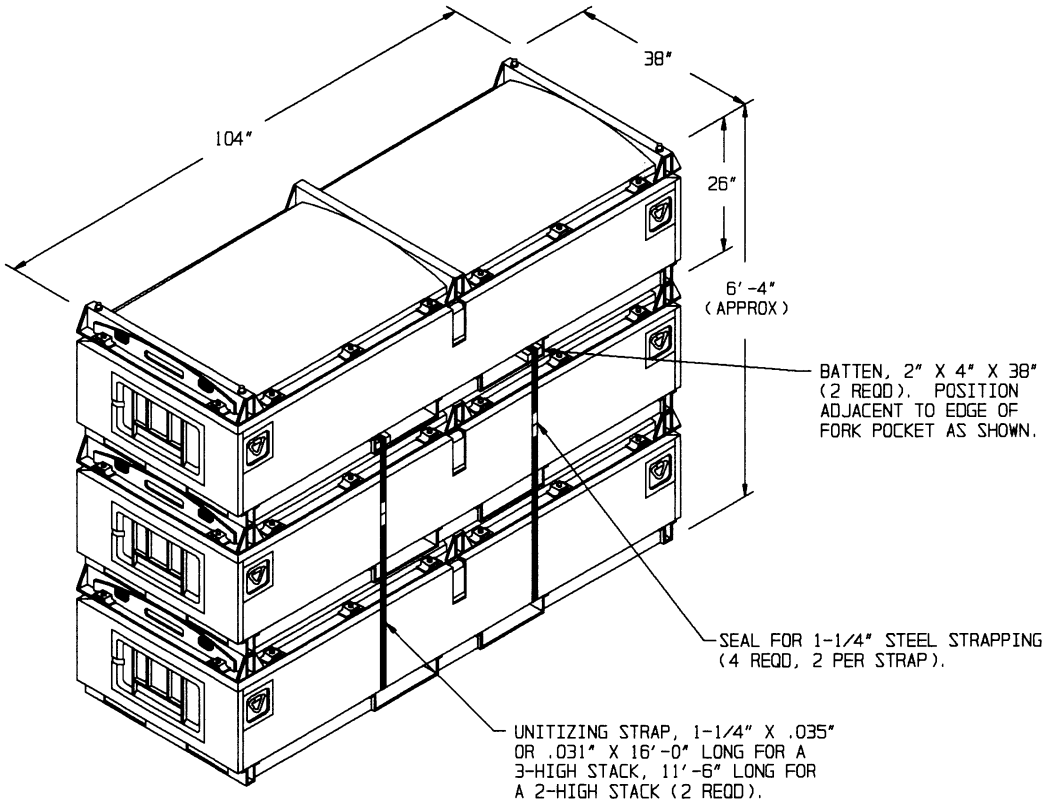
O. CAUTION: WHEN POWER OR PNEUMATIC NAILERS ARE BEING USED IN THE APPLICATION OF NAILED FLOORLINE BLOCKING OR BRACING, CONTAINERS BEING LOADED INTO THE CONVEYANCE MUST BE POSITIONED TO ALLOW A CLEAR PATH OF EXIT FOR THE OPERATOR AT ALL TIMES, SHOULD AN EMERGENCY EXIT BECOME NECESSARY.

P. 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.

Q. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

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.



CONTAINER STACK

UNITIZATION PROCEDURES:

1. WHEN STACKING CONTAINERS FOR UNITIZING, PLACE THE UPPER CONTAINER DIRECTLY ON TOP OF THE LOWER CONTAINER SO THAT THE STACKING LUGS ARE ENGAGED. IT IS NOT NECESSARY TO KEEP ANY PARTICULAR ORIENTATION OF THE CONTAINER ENDS WHILE STACKING.

2. INSTALLATION OF 1-1/4" X .035" OR .031" UNITIZING STRAPS. SEE GENERAL NOTE "J" ON PAGE 2.

   A. POSITION 2" X 4" X 38" BATTENS AT THE EDGE OF THE FORK POCKETS OF THE TOP CONTAINER IN THE STACK AS SHOWN.

   B. POSITION STRAPS TO ENCIRCLE THE CONTAINERS THRU THE STRUCTURAL CHANNEL OPENING OF A LOWER CONTAINER AND OVER THE TOP OF THE CONTAINERS AS SHOWN IN THE ISOMETRIC VIEW AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG THE SIDES AND FLAT ACROSS THE TOP AND BOTTOM OF THE STACK.

   C. THE STRAPPING WILL BE FIRMLY TENSIONED BUT NOT SO MUCH AS TO DAMAGE THE CONTAINERS. EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO SEALS BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS EACH SEAL, AS SHOWN IN THE "STRAP JOINT B" DETAIL ON PAGE 11. THE LAP JOINT MAY BE MADE EITHER ALONG THE SIDE OF THE STACK OR ON TOP, AS DESIRED. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEAL. SEE GENERAL NOTE "J" ON PAGE 2.

CONTAINER OR CONTAINER STACK HANDLING:

1. APPROVED MATERIALS HANDLING EQUIPMENT (MHE) IS SPECIFIED IN OTHER DOCUMENTS. MHE IS INTENDED TO MEAN EQUIPMENT SUCH AS FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, AND SPREADER BARS.

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

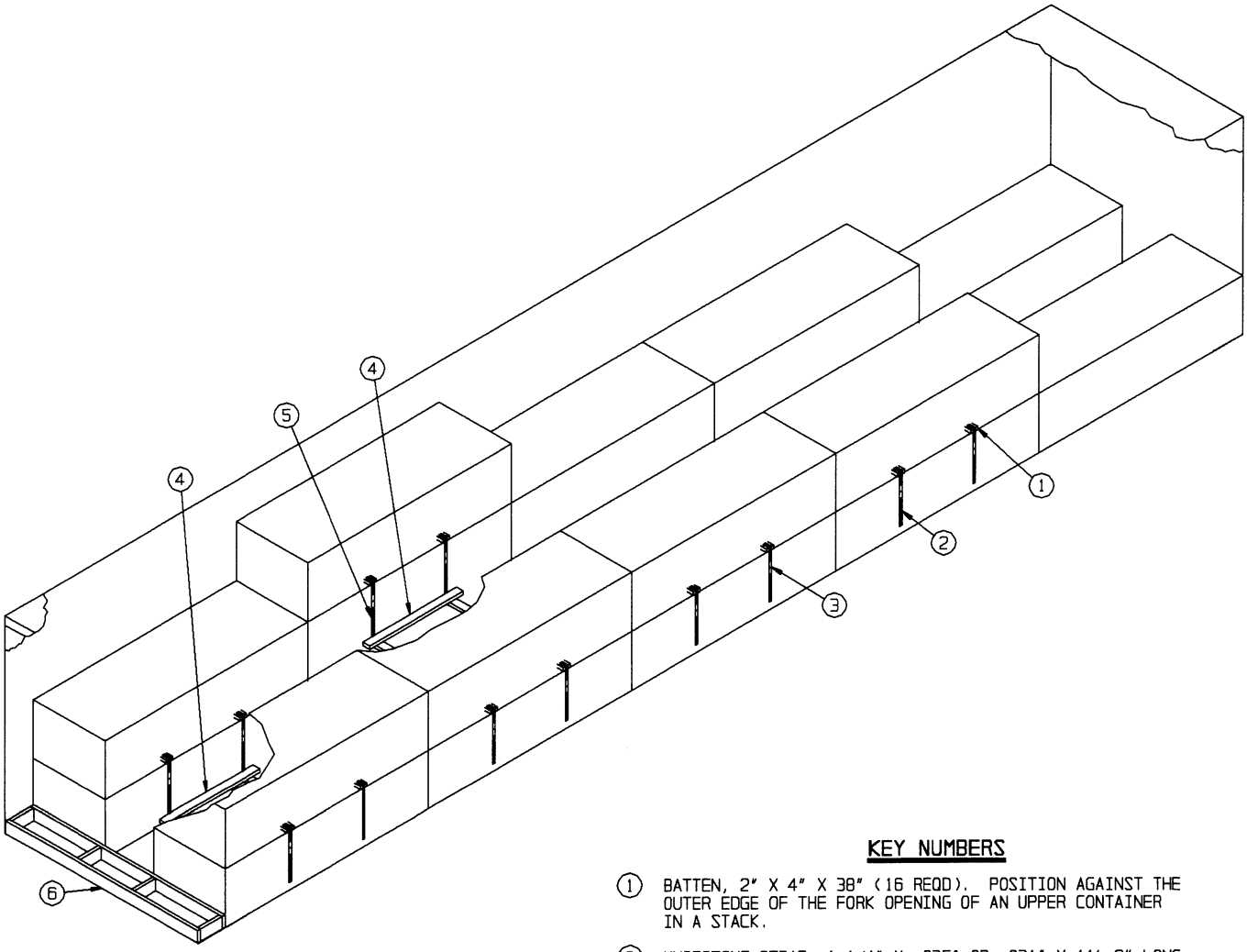
   A. ONLY APPROVED AND APPROPRIATELY SIZED MATERIAL HANDLING EQUIPMENT WILL BE USED FOR HANDLING THE DEPICTED CONTAINERS.

   B. IF HANDLING IS ACCOMPLISHED WITH A FORKLIFT TRUCK, THE CONTAINERS MUST BE HANDLED FROM A SIDE POSITION AS MUCH AS POSSIBLE. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGE TO A CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD.

   C. IF A CONTAINER OR STACK OF CONTAINERS IS HANDLED BY SLINGING, THE SLING MUST BE OF SUCH A DESIGN THAT LIFTING IS DONE FROM THE LIFTING POINTS ON THE BOTTOM CONTAINER OF A STACK.

   D. WHEN LOADING A CONTAINER OR CONTAINER STACK, THE CONTAINER OR STACK WILL BE PARTIALLY PLACED INTO THE END OF THE TRAILER BY HANDLING WITH A FORKLIFT FROM THE SIDE. THE FORKLIFT THEN MUST INSERT ITS TINES FROM THE END OF THE CONTAINER OR STACK, LIFT THE END SLIGHTLY, THEN PROCEED TO PUSH THE CONTAINER OR STACK INTO ITS FINAL POSITION WITHIN THE TRAILER. CARE MUST BE EXERCISED TO AVOID DAMAGE TO THE CONTAINER ENDS, ETC., DURING PUSHING OPERATIONS.

   E. WHEN UNLOADING A CONTAINER OR CONTAINER STACK FROM THE TRAILER, THE FORKLIFT TINES WILL BE INSERTED UNDER THE LOWER CONTAINER, THE FORKLIFT WILL THEN ELEVATE THE END SLIGHTLY ABOVE THE FLOOR, AND BEGIN DRAGGING THE CONTAINER OR STACK FROM THE TRAILER AFTER ATTACHING A CHAIN OR WEB STRAP FROM A LOWER CONTAINER LIFT POINT AROUND THE FORKLIFT MAST TO A LOWER LIFT POINT ON THE OPPOSITE SIDE OF THE CONTAINER.



KEY NUMBERS

(1) BATTEN, 2" X 4" X 38" (16 REQD). POSITION AGAINST THE OUTER EDGE OF THE FORK OPENING OF AN UPPER CONTAINER IN A STACK.

(2) UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" LONG STEEL STRAPPING (14 REQD). POSITION THROUGH THE FORK POCKETS OF THE TOP AND BOTTOM CONTAINERS IN TWO-HIGH STACKS AND SO AS TO CENTER ON A BATTEN, PIECE MARKED (1). SEE THE "UNITIZATION PROCEDURES" ON PAGE 3.

(3) SEAL FOR 1-1/4" STEEL STRAPPING, (32 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH 2 PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT" DETAILS ON PAGE 11 AND GENERAL NOTE "J" ON PAGE 2.

(4) ANTI-SWAY BRACE, (6 REQD). SEE THE DETAIL ON PAGE 11. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER AND BETWEEN THE SECOND LAYER CONTAINERS IN THE LOAD UNIT WHICH HAS A CONTAINER IN THE THIRD LAYER. SEE GENERAL NOTES "L" AND "M" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 5.

(5) UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (2 REQD). POSITION THRU THE FORK POCKETS OF THE TOP AND BOTTOM CONTAINER IN THE THREE-HIGH STACK AND SO AS TO CENTER ON A BATTEN, PIECE MARKED (1).

(6) REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY" DETAIL ON PAGE 12. SEE SPECIAL NOTE 5 ON PAGE 5.

19-UNIT LOAD IN A 45'-0" LONG BY 8'-2" WIDE VAN TRAILER

SPECIAL NOTES:

1. A 19-UNIT LOAD IS SHOWN IN A 45'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) VAN TRAILER WHICH HAS A NAILABLE FLOOR. TRAILERS OF OTHER DIMENSIONS CAN BE USED.

2. THE TRAILER SHOWN IN THE LOAD VIEW ON PAGE 4 IS EQUIPPED WITH A SQUARE FRONT WALL. IF THE TRAILER TO BE LOADED HAS ROUNDED FRONT CORNERS, A "FORWARD BLOCKING ASSEMBLY" MUST BE USED. SEE THE DETAIL ON PAGE 11.

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 DOUBLED 2" X 6" X 12" MATERIAL. POSITION AGAINST THE CONTAINER, ONE AT EACH END, AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/3-10d NAILS.

4. WHEN AN ANTI-SWAY BRACE IS USED IN A LOAD UNIT WHICH HAS A SINGLE CONTAINER IN THE TOP LAYER, THE RETAINER PIECES OF THE ANTI-SWAY BRACE MUST BE POSITIONED BETWEEN AND IN CONTACT WITH THE BATTENS, PIECES MARKED ①, WHICH ARE USED UNDER THE UNITIZING STRAPS, PIECES MARKED ⑤.

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 MORE THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 12. IF THE SPACE IS MORE THAN 9", USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN.

6. IF THE TRAILER BEING LOADED IS EQUIPPED WITH ROLL-UP TYPE DOORS, NAILED TYPE REAR BLOCKING MUST BE USED IN LIEU OF THE REAR BLOCKING ASSEMBLY, PIECE MARKED ⑤. SEE PIECE MARKED ⑨ ON PAGE 6 FOR GUIDANCE.

7. THE PLACEMENT OF CONTAINERS IN THE LOAD VIEW ON PAGE 4 IS APPLICABLE FOR A "WESTERN" TYPE TRAILER WHICH HAS THE REAR TANDEMS AT THE EXTREME REAR OF THE TRAILER. THE DEPICTED LOAD CAN BE INCREASED, IF DESIRED. TWENTY CONTAINERS CAN BE LOADED BY PLACING THE ADDED CONTAINER OPPOSITE THE THIRD-LAYER CONTAINER IN THE FOURTH LOAD UNIT. SECURE WITH TWO PIECES MARKED ① AND ⑤. IF DESIRED, 21 CONTAINERS CAN BE LOADED. THE TWENTY-FIRST CONTAINER SHOULD BE ADDED IN THE SECOND LAYER OF THE FIRST LOAD UNIT. THIS CONTAINER PLACEMENT IS NOT MANDATORY BUT IS PROVIDED AS GUIDANCE ONLY. CONTAINERS SHOULD BE PLACED SO AS TO OBTAIN THE BEST WEIGHT DISTRIBUTION.

8. FOR TRAILERS OTHER THAN THE "WESTERN" TYPE, WITH A LOAD QUANTITY OF 19 CONTAINERS, THE SECOND LAYER SHOULD BE FULL EXCEPT FOR THE LAST LOAD UNIT WHICH WILL HAVE ONLY ONE CONTAINER IN THE TOP LAYER. TWENTY CONTAINERS CAN BE LOADED IN TWO FULL LAYERS. A LOAD IN A TRAILER OTHER THAN A "WESTERN" TYPE IS LIMITED TO 20 CONTAINERS.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. IF THE LOAD IS TO BE REDUCED BY ONE CONTAINER, OMIT THE CONTAINER IN THE TOP LAYER. ADDITIONAL REDUCTION CAN BE ACCOMPLISHED BY OMITTING CONTAINERS FROM THE SECOND LAYER, PREFERABLY FROM THE FRONT PORTION OF THE LAYER.

10. IF A 48'-0" LONG TRAILER IS FURNISHED FOR LOADING, A MAXIMUM OF 19 CONTAINERS CAN BE LOADED. THE SAME LOADING PATTERN AS IS SHOWN FOR A 45'-0" LONG TRAILER MAY BE USED. HOWEVER, IN ORDER TO OBTAIN PROPER WEIGHT DISTRIBUTION, IT WILL BE NECESSARY TO PLACE A SPACER ASSEMBLY AT THE FRONT OF THE LOAD. SEE THE "SPACER ASSEMBLY" DETAIL ON PAGE 13. THE ASSEMBLY SHOULD BE 12" LONG.

11. IF A 40'-0" LONG TRAILER IS FURNISHED FOR LOADING, REFER TO THE LOADING PROCEDURES ON PAGES 6 AND 7 FOR GUIDANCE.

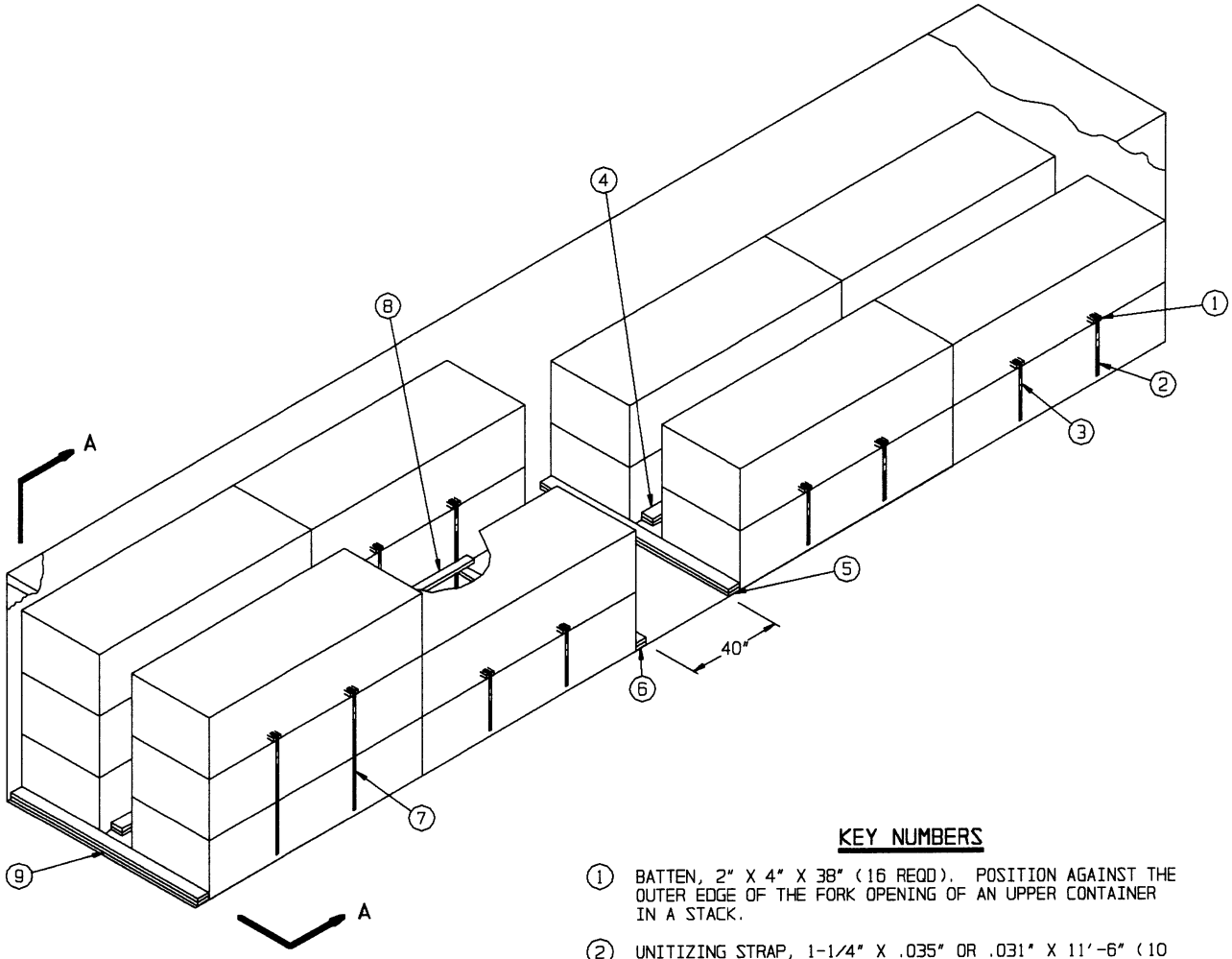
12. IF THE CNU-238/E CONTAINERS ARE LOADED WITH AN ITEM WHICH IS OF LIGHTER WEIGHT THAN THE DEPICTED ITEM, THE NUMBER OF CONTAINERS IN THE LOAD CAN BE INCREASED.

LOAD AS SHOWN

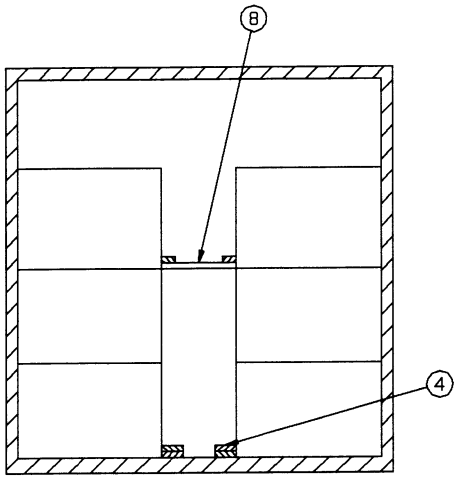
ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	19	40,983 LBS
DUNNAGE		250 LBS
TOTAL WEIGHT		41,233 LBS (APPROX)

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	133 20	89 20
NAILS	NO. REQD	POUNDS
10d (3")	96	1-1/2
STEEL STRAPPING, 1-1/4" - - 193' REQD - - - - 28 LBS SEAL FOR 1-1/4" STRAPPING - - 32 REQD - - - - 2 LBS		



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

① BATTEN, 2" X 4" X 38" (16 REQD). POSITION AGAINST THE OUTER EDGE OF THE FORK OPENING OF AN UPPER CONTAINER IN A STACK.

② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 11'-6" (10 REQD). POSITION THRU THE FORK POCKETS OF THE TOP AND BOTTOM CONTAINERS IN THE TWO-HIGH STACKS AND SO AS TO CENTER ON A BATTEN, PIECE MARKED ①. SEE THE "UNITIZATION PROCEDURES" ON PAGE 3.

③ SEAL FOR 1-1/4" STEEL STRAPPING (32 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT" DETAILS ON PAGE 11 AND GENERAL NOTE "L" ON PAGE 2.

④ SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (16 REQD). POSITION AGAINST THE CONTAINER AT EACH END. 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 "L" ON PAGE 2.

⑤ FORWARD INTERMEDIATE HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/10-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 7.

⑥ REAR INTERMEDIATE HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/6-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/6-20d NAILS.

⑦ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING (6 REQD). POSITION THRU THE FORK POCKETS OF THE TOP AND BOTTOM CONTAINERS IN THE THREE-HIGH STACKS AND SO AS TO CENTER ON A BATTEN, PIECE MARKED ①.

⑧ ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 11. INSTALL BETWEEN LATERALLY ADJACENT SECOND-LAYER CONTAINERS IN THE LOAD UNIT WHICH HAS A SINGLE CONTAINER IN THE THIRD LAYER AND BETWEEN THE TOP LAYER CONTAINERS IN THE THREE-HIGH STACK. SEE GENERAL NOTE "M" ON PAGE 2.

⑨ REAR HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/10-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

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

SPECIAL NOTES:

1. A 19-UNIT LOAD IS SHOWN IN A 40'-0" LONG BY 7'-8" WIDE (INSIDE DIMENSION) VAN TRAILER WHICH HAS A NAILABLE FLOOR. TRAILERS OF OTHER DIMENSIONS CAN BE USED. TRAILERS HAVING NON-NAILABLE FLOORS CAN BE USED. SEE SPECIAL NOTES 3 THROUGH 5 BELOW FOR GUIDANCE.

2. THE TRAILER SHOWN IN THE LOAD VIEW ON PAGE 6 IS EQUIPPED WITH A SQUARE FRONT WALL. IF THE TRAILER TO BE LOADED HAS ROUNDED FRONT CORNERS, A "FORWARD BLOCKING ASSEMBLY" MUST BE USED. SEE THE DETAIL ON PAGE 11.

3. IF THE TRAILER BEING LOADED DOES NOT HAVE A NAILABLE FLOOR, OR IF DESIRED, ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ⑧ IN THE LOAD ON PAGE 6, MAY BE USED BETWEEN THE LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER IN LIEU OF USING THE NAILED SIDE BLOCKING, PIECES MARKED ④.

4. WHEN AN ANTI-SWAY BRACE IS USED IN A LOAD UNIT WHICH HAS A SINGLE CONTAINER IN THE TOP LAYER, THE RETAINER PIECES OF THE ANTI-SWAY BRACE MUST BE POSITIONED BETWEEN AND IN CONTACT WITH THE BATTENS, PIECES MARKED ①, WHICH ARE USED UNDER THE UNITIZING STRAPS, PIECES MARKED ⑦.

5. IN TRAILERS NOT HAVING A NAILABLE FLOOR, OR IF DESIRED IN OTHER TRAILERS, A SPACER ASSEMBLY CAN BE USED IN THE SPACE BETWEEN THE SECOND AND THIRD LOAD UNITS IN LIEU OF USING THE NAILED HEADERS, PIECES MARKED ⑤ AND ⑥. SEE THE "SPACER ASSEMBLY" DETAIL ON PAGE 13. THE ASSEMBLY SHOULD BE 51" LONG.

6. IN TRAILERS NOT HAVING A NAILABLE FLOOR, OR IF DESIRED IN OTHER TRAILERS, A REAR BLOCKING ASSEMBLY CAN BE USED AT THE REAR OF THE LOAD IN LIEU OF USING PIECE MARKED ⑨. IF THE SPACE AT THE REAR OF THE LOAD IS MORE THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 12. IF THE SPACE IS MORE THAN 9", USE THE "REAR BLOCKING ASSEMBLY A", AS DETAILED ON PAGE 12. IF THE SPACE IS LESS THAN 1-1/2", REAR BLOCKING IS NOT REQUIRED.

7. THE DEPICTED LOADING PATTERN IS APPLICABLE FOR "WESTERN" TYPE TRAILERS WHICH HAVE THE REAR TANDEMS LOCATED AT THE EXTREME REAR OF THE TRAILER. IF THE TRAILER TO BE LOADED IS OTHER THAN THE "WESTERN" TYPE, OMIT PIECES MARKED ⑤ AND ⑥, OR THE SPACER ASSEMBLY IF IT IS USED, AND POSITION THE CONTAINER LOAD UNITS AGAINST EACH OTHER.

8. THE DEPICTED LOAD CAN BE INCREASED BY ONE OR TWO CONTAINERS, IF DESIRED. TWENTY CONTAINERS CAN BE SHIPPED BY PLACING THE ADDED CONTAINER OPPOSITE THE THIRD-LAYER CONTAINER IN THE THIRD LOAD UNIT. SUBSTITUTE TWO PIECES MARKED ⑦ FOR THE TWO PIECES MARKED ② IN THAT STACK. FOR SHIPMENT OF TWENTY-ONE CONTAINERS, ADD A CONTAINER IN THE SECOND LOAD UNIT. THIS CONTAINER PLACEMENT IS NOT MANDATORY BUT IS PROVIDED AS GUIDANCE ONLY. CONTAINERS SHOULD BE PLACED SO AS TO OBTAIN THE BEST WEIGHT DISTRIBUTION.

9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. IF THE LOAD IS TO BE REDUCED BY ONE CONTAINER, OMIT THE CONTAINER FROM THE TOP LAYER OF THE THIRD LOAD UNIT. ADDITIONAL REDUCTION CAN BE ACCOMPLISHED BY OMITTING CONTAINERS FROM THE REAR LOAD UNIT.

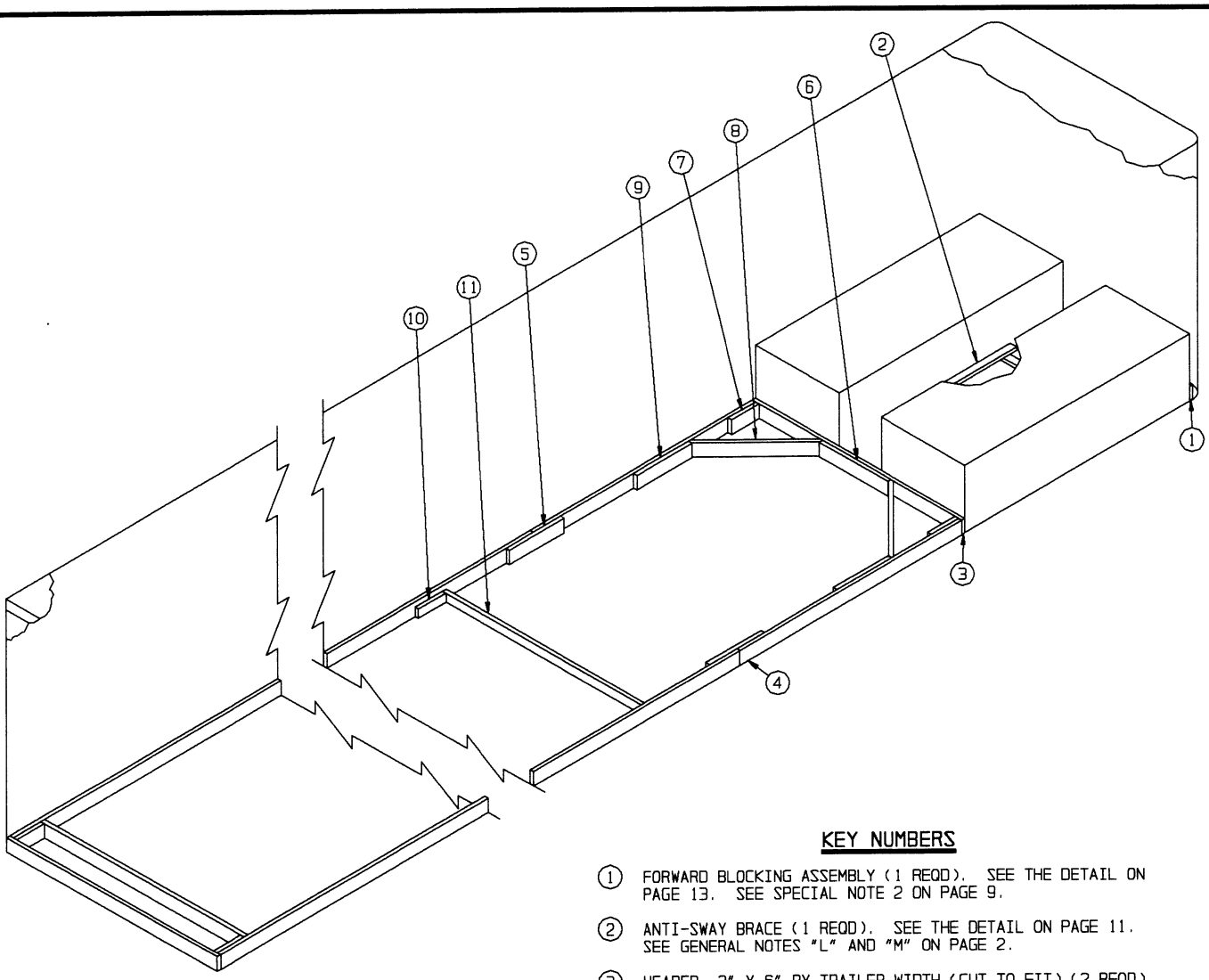
10. IF A 45'-0" OR 48'-0" LONG TRAILER IS FURNISHED FOR LOADING REFER TO THE LOADING PROCEDURES ON PAGES 4 AND 5 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4" 2" X 6"	77 78	52 78
NAILS	NO. REQD	POUNDS
10d (3") 20d (4")	166 6	2-3/4 1/4
STEEL STRAPPING, 1-1/4" - - 211' REQD - - - - 31 LBS SEAL FOR 1-1/4" STRAPPING - - 32 REQD - - - - 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	19	40,983 LBS
DUNNAGE		296 LBS
TOTAL WEIGHT		41,279 LBS (APPROX)

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



ISOMETRIC VIEW

KEY NUMBERS

(1) FORWARD BLOCKING ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 13. SEE SPECIAL NOTE 2 ON PAGE 9.

(2) ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 11. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.

(3) HEADER, 2" X 6" BY TRAILER WIDTH (CUT TO FIT) (2 REQD).

(4) SIDE STRUT, 2" X 6" BY CUT-TO-FIT BETWEEN THE HEADERS, PIECES MARKED (3).

(5) SPLICE PIECE, 2" X 6" X 24" (AS REQD). POSITION SO AS TO CENTER ON THE JOINT OF THE SIDE STRUTS, PIECES MARKED (4), AND NAIL W/4-10d NAILS AT EACH END.

(6) CENTER CLEAT, 2" X 6" X 30" (1 REQD). NAIL TO THE FORWARD HEADER, PIECE MARKED (3), W/6-10d NAILS.

(7) POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO A SIDE STRUT, PIECE MARKED (4), W/5-10d NAILS. TOENAIL TO THE ADJACENT HEADER, PIECE MARKED (3), W/3-12d NAILS.

(8) 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, PIECE MARKED (3), AND/OR THE SIDE STRUT, PIECE MARKED (4), W/2-16d NAILS AT EACH END.

(9) BACK-UP CLEAT, 2" X 6" X 24" (2 REQD). NAIL TO A SIDE STRUT, PIECE MARKED (4), W/8-10d NAILS.

(10) STRUT BRACE RETAINER CLEAT, 2" X 4" X 12" (AS REQD). NAIL TO A SIDE STRUT, PIECE MARKED (4), W/3-10d NAILS. SEE SPECIAL NOTE 3 ON PAGE 9.

(11) STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 3" (CUT TO FIT) (MINIMUM OF ONE REQD). NAIL TO THE POCKET CLEATS, PIECES MARKED (7), AND/OR TO THE STRUT BRACE RETAINER CLEATS, PIECES MARKED (10), W/2-12d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 9.

TYPICAL LTL (2-UNIT LOAD)

SPECIAL NOTES:

1. A 2-UNIT LOAD IS SHOWN IN A 7'-8" WIDE (INSIDE DIMENSION) VAN TRAILER. TRAILERS OF OTHER WIDTHS CAN BE USED.

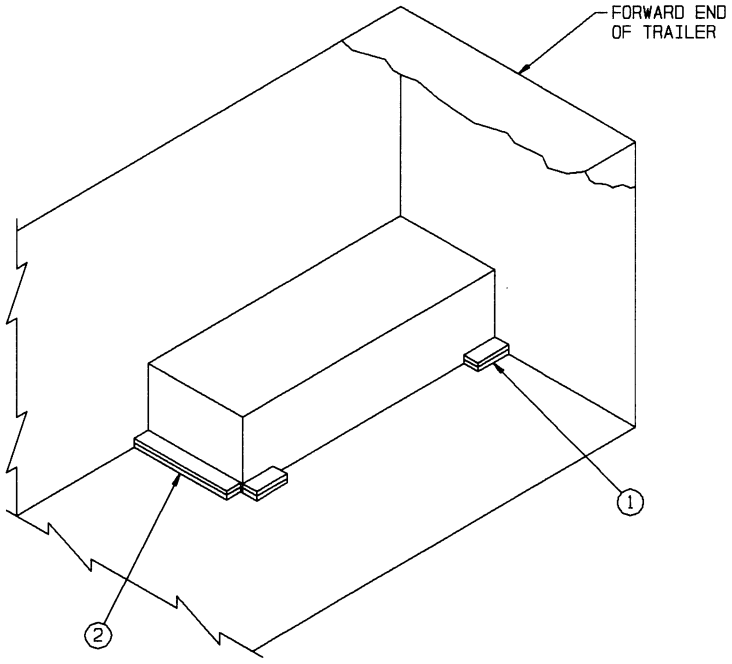
2. A TRAILER EQUIPPED WITH ROUNDED FRONT CORNERS IS SHOWN. IF THE TRAILER TO BE LOADED HAS A SQUARE FRONT, OMIT THE FORWARD BLOCKING ASSEMBLY, PIECE MARKED ①, AND POSITION THE CONTAINERS DIRECTLY AGAINST THE FRONT WALL.

3. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO THE POCKET CLEATS, PIECES MARKED ⑦. IF THE SIDE STRUTS, PIECES MARKED ④, ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑪, AND TWO STRUT BRACE RETAINING CLEATS, PIECES MARKED ⑩, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.

4. THE K-BRACE BLOCKING, SHOWN AS PIECES MARKED ③ THROUGH ⑪, IS ADEQUATE FOR RETAINING A MAXIMUM OF NINE CONTAINERS.

5. TRAILERS EQUIPPED WITH ROLL-UP TYPE DOORS MAY BE USED; HOWEVER, THE NAILED-HEADER TYPE METHOD OF REAR BLOCKING MUST BE INSTALLED IN LIEU OF THE "K-BRACE" TYPE BLOCKING, PIECES MARKED ③ THROUGH ⑪. SEE PIECE MARKED ⑨ ON PAGE 6 FOR A TYPICAL INSTALLATION. THE HEADER WILL BE NAILED WITH NOT LESS THAN 6-10d NAILS PER PIECE. A HEADER WITH 6 NAILS PER PIECE IS ADEQUATE FOR AN LTL LOAD OF NOT MORE THAN SEVEN CONTAINERS. FOR EACH ADDITIONAL CONTAINER, ADD A 10d NAIL IN EACH LAYER OF THE HEADER.

TYPICAL LTL (2-UNIT LOAD)



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 7'-8" WIDE (INSIDE DIMENSION) CONVENTIONAL VAN TRAILER WHICH HAS A NAILABLE FLOOR IS SHOWN. TRAILERS OF OTHER WIDTHS CAN BE USED.

2. IF THE TRAILER BEING LOADED IS EQUIPPED WITH ROUNDED FRONT CORNERS, THE CONTAINER SHOULD BE POSITIONED IN THE CENTER OF THE TRAILER WIDTH AND SIDE BLOCKING INSTALLED ON BOTH SIDES OF THE CONTAINER. IN LIEU OF DOING THAT, A "FORWARD BLOCKING ASSEMBLY" MAY BE INSTALLED. SEE THE DETAIL ON PAGE 11.

3. THE HEADER SHOWN AS PIECE MARKED ② WILL NOT BE RELIED UPON TO RETAIN MORE THAN THREE CONTAINERS.

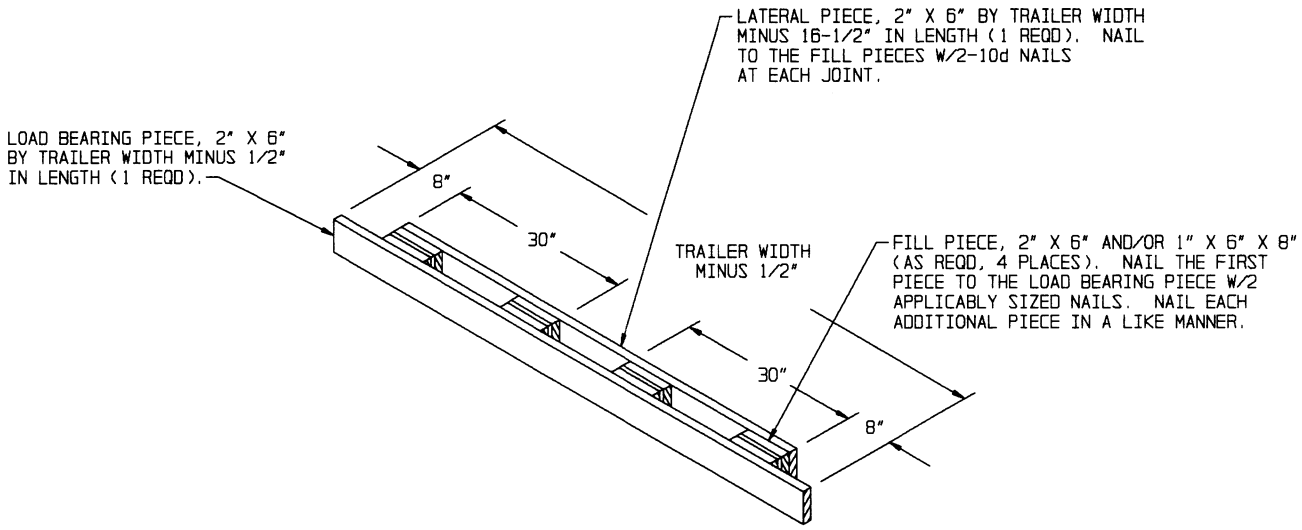
4. IF MORE THAN ONE CONTAINER IS TO BE TRANSPORTED, THE LOAD SHOULD BE FORMED IN ROWS, WITH THE CONTAINERS POSITIONED AGAINST OPPOSITE SIDEWALLS. SIDE BLOCKING, SHOWN AS PIECE ① ABOVE, MUST BE INSTALLED FOR THE ADDED CONTAINER(S). IF THE TRAILER HAS ROUNDED CORNERS AT THE FORWARD END, INSTALL A "FORWARD BLOCKING ASSEMBLY".

KEY NUMBERS

① SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (2 REQD). POSITION AS SHOWN. 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 "L" ON PAGE 2. SEE SPECIAL NOTE 2 AT LEFT.

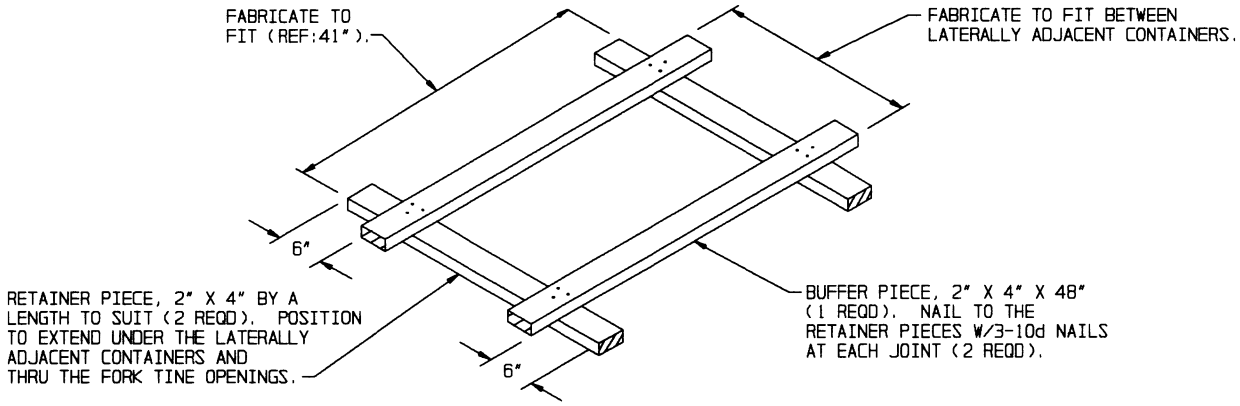
② HEADER, 2" X 6" X 38" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 3 AT THE LEFT.

TYPICAL LTL (1-UNIT LOAD)

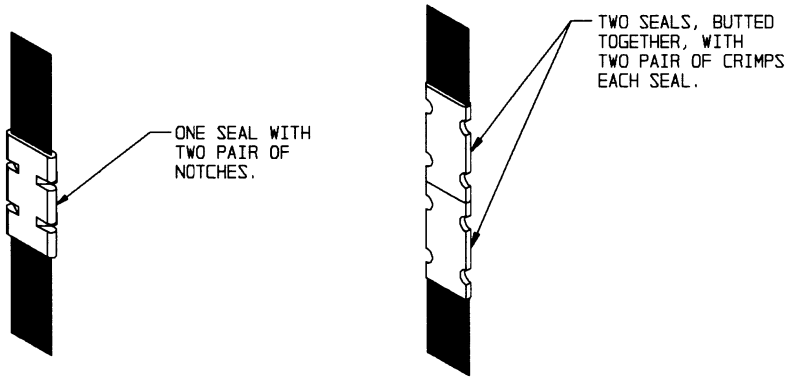


FORWARD BLOCKING ASSEMBLY

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", ADDITIONAL FILL PIECES WILL BE USED.



ANTI-SWAY BRACE



STRAP JOINT A

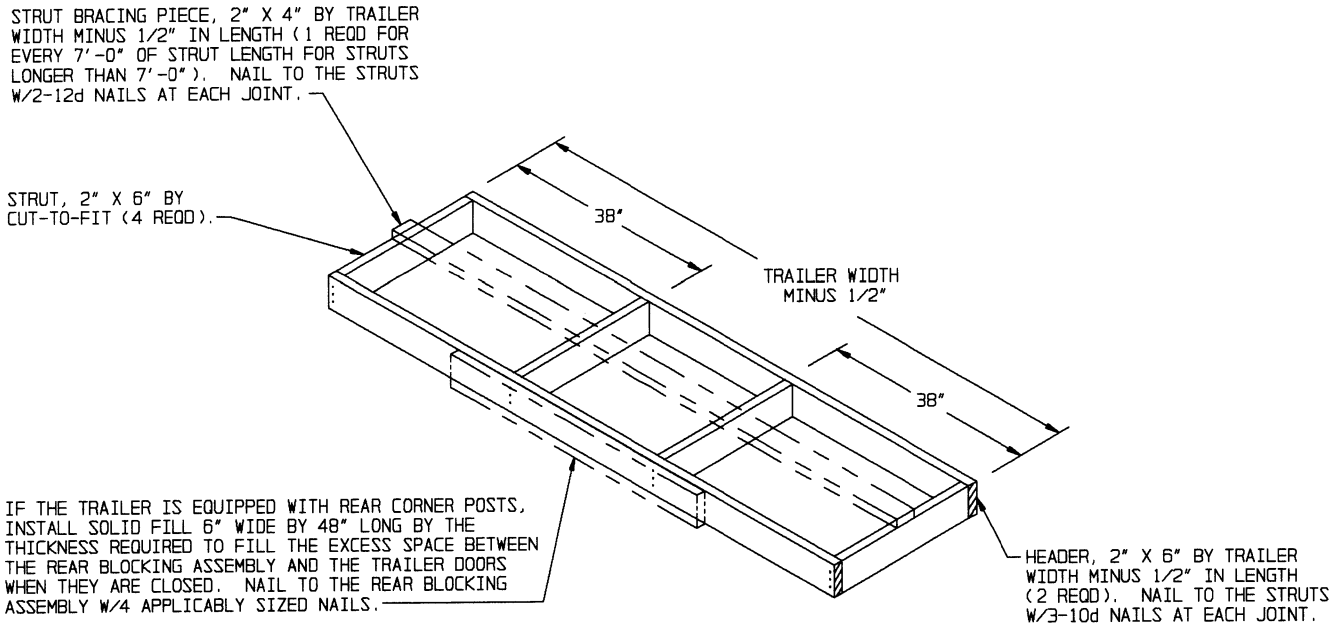
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.

STRAP JOINT B

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

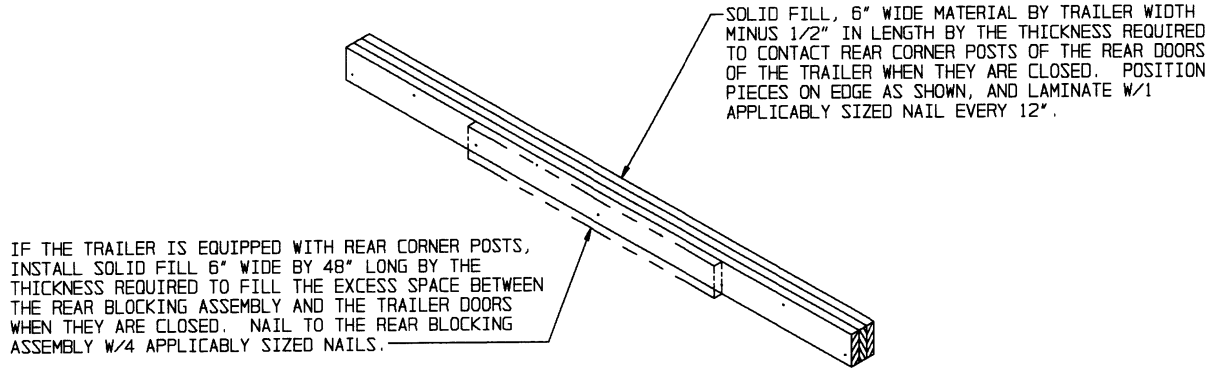
END-OVER-END LAP JOINT DETAILS

DETAILS



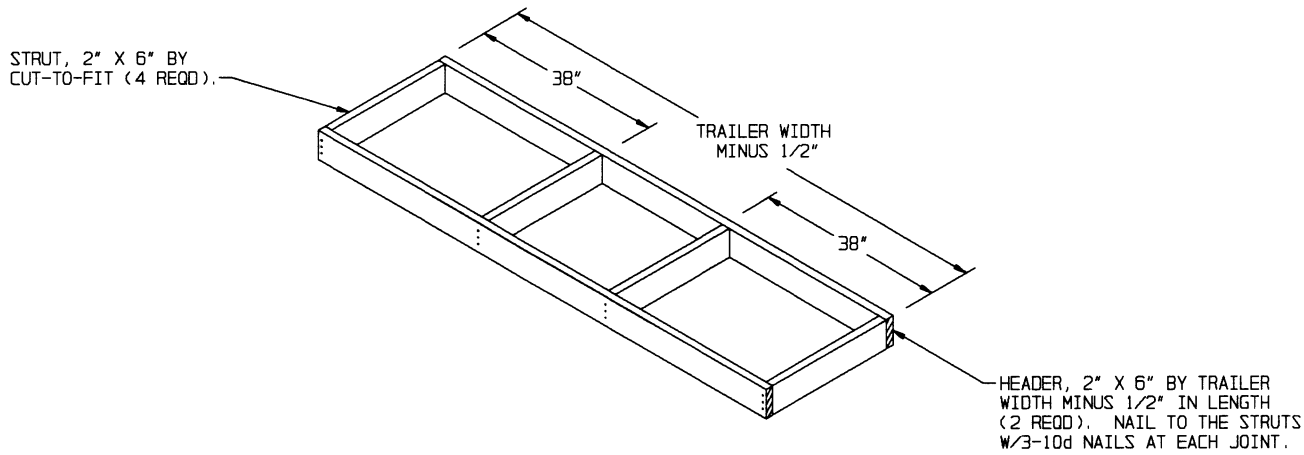
REAR BLOCKING ASSEMBLY A

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



REAR BLOCKING ASSEMBLY B

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



SPACER ASSEMBLY

THIS ASSEMBLY, CONSTRUCTED 12" LONG, IS FOR USE AT THE FRONT END OF A LOAD IN A 48'-0" LONG TRAILER. SEE SPECIAL NOTE 10 ON PAGE 5. THIS ASSEMBLY IS ALSO FOR USE IN THE LOAD ON PAGE 6 IN LIEU OF PIECES MARKED ⑤ AND ⑥. SEE SPECIAL NOTE 5 ON PAGE 7.