

# LOADING AND BRACING (TL & LTL) IN VAN TRAILERS<sup>⊕</sup> OF MK20 (ROCKEYE II) OR CBU-78/B (GATOR) BOMBS PACKED IN CNU-319/E SHIPPING AND STORAGE CONTAINERS

## INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES AND MATERIAL SPECIFICATIONS - - - - -	2
UNITIZATION, STACKING AND HANDLING PROCEDURES - - - - -	3
29-UNIT LOAD IN A 45'-0" LONG BY 8'-2" WIDE VAN TRAILER - - - - -	4,5
29-UNIT LOAD IN A 40'-0" LONG BY 7'-8" WIDE VAN TRAILER - - - - -	6,7
TYPICAL LTL (2-UNIT LOAD) - - - - -	8
TYPICAL LTL (1-UNIT LOAD) - - - - -	9
DETAILS - - - - -	10-12

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

U.S. ARMY MATERIEL COMMAND DRAWING			
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SEPTEMBER 1995			
U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	CLASS	DIVISION	DRAWING
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DO NOT SCALE

## GENERAL NOTES

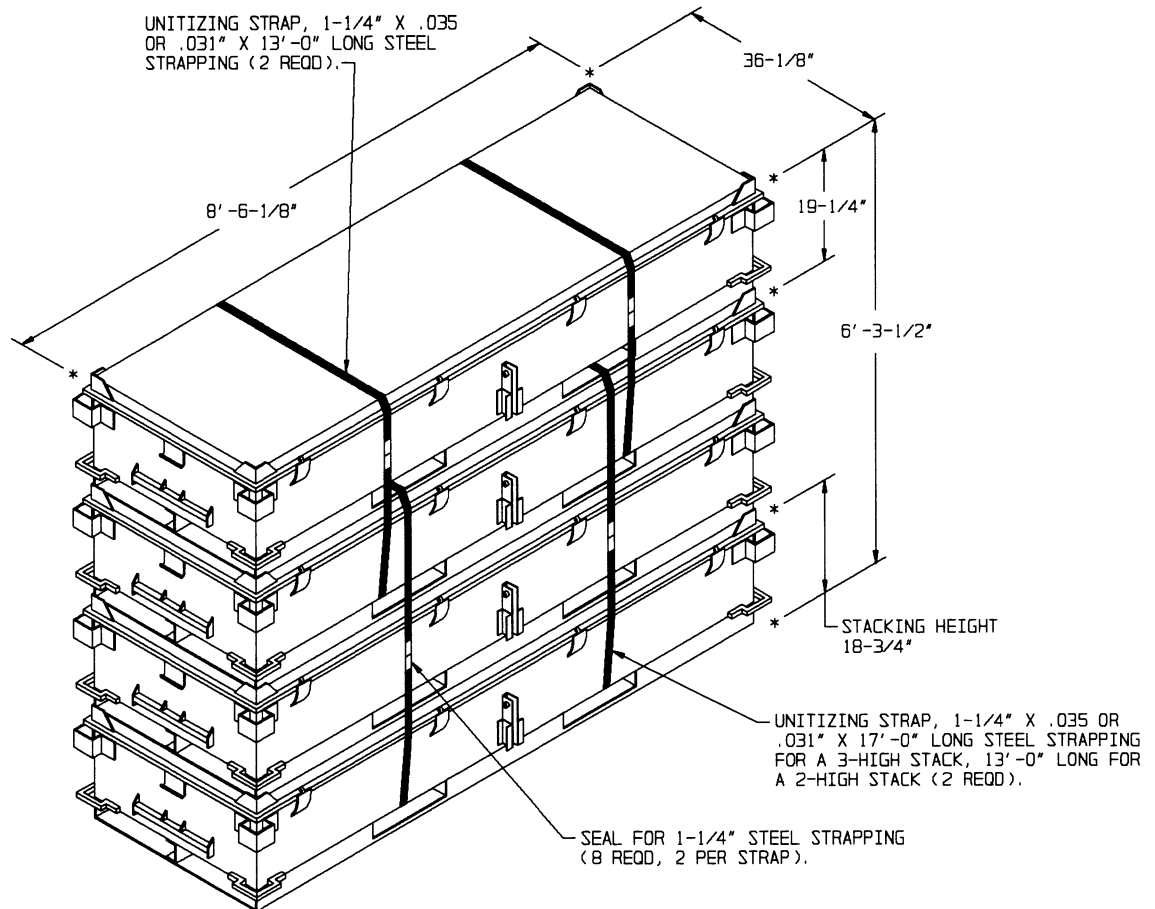
(GENERAL NOTES CONTINUED)

- 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 (ROCKEYE II) OR CBU-78/B (GATOR) BOMBS PACKED IN CNU-319/E CONTAINERS. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-319/E CONTAINER WITH BOMBS INSTALLED.
- CONTAINER DIMENSIONS -- 102-1/8" L X 36-1/8" W X  
19-1/4" H  
CONTAINER WEIGHT -- 1,475 LBS (APPROX)  
CONTAINER CUBE -- 41.1 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 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 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 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 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 LOADS, UP TO 46,000 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 THE DESIGNATED ITEM, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING 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.
- 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.

(CONTINUED AT RIGHT)

## 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.



### CONTAINER STACK

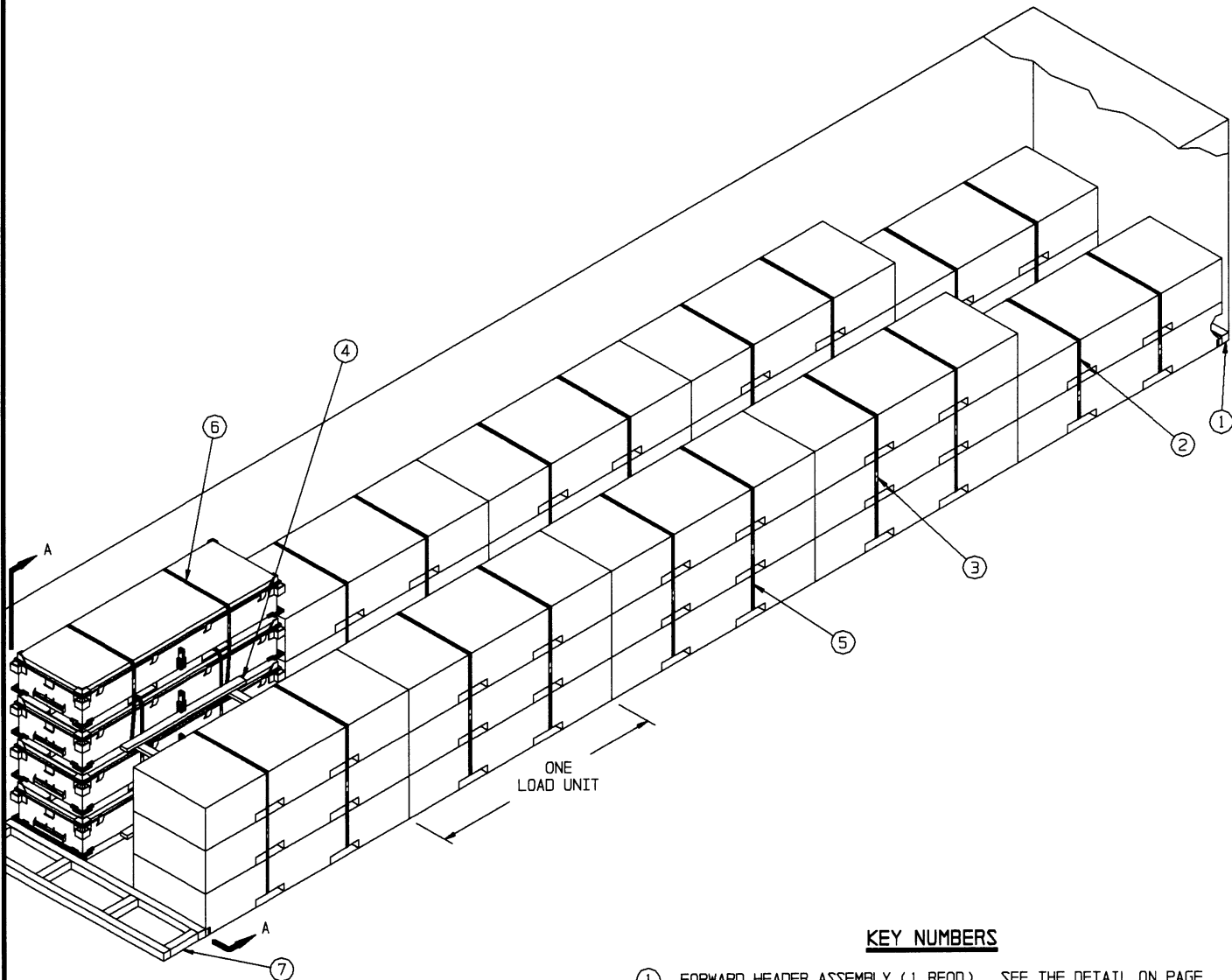
#### CONTAINER OR STACK HANDLING PROCEDURES:

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 ON THE BOTTOM OF THE LOWER CONTAINER.
  - 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.

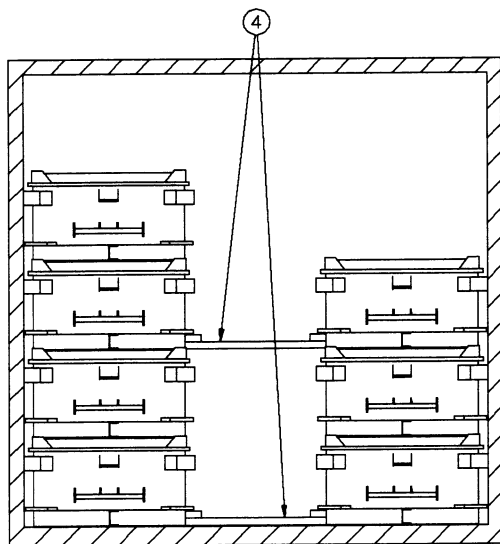
#### UNITIZATION PROCEDURES:

1. WHEN STACKING CONTAINERS FOR UNITIZING, PLACE THE UPPER CONTAINER DIRECTLY ON TOP OF THE LOWER CONTAINER. POSITION THE FORWARD END OF THE UPPER CONTAINER ABOVE THE FORWARD END OF THE LOWER ONES, AS SHOWN.
2. INSTALLATION OF 1-1/4" X .035" OR .031" UNITIZING STRAPS. SEE GENERAL NOTE "J" ON PAGE 2.
  - A. POSITION STRAPS TO ENIRCLE THE CONTAINERS THRU THE FORKLIFT OPENINGS 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.
  - B. 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 12. THE LAP JOINT WILL BE MADE ALONG THE SIDE OF THE STACK. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEAL. SEE GENERAL NOTE "J" ON PAGE 2.

### UNITIZATION, STACKING AND HANDLING PROCEDURES



**ISOMETRIC VIEW**



**SECTION A-A**

**KEY NUMBERS**

- ① FORWARD HEADER ASSEMBLY (1 REQD). SEE THE DETAIL ON PAGE 10. POSITION SO THE FILL PIECES WILL BE AGAINST THE CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 5.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 13'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE CONTAINERS IN THE TWO-HIGH STACKS. SEE THE "UNITIZATION PROCEDURES" ON PAGE 3 FOR GUIDANCE.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (44 REQD, 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 12 AND GENERAL NOTE "J" ON PAGE 2.
- ④ ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 10. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE BOTTOM LAYER AND BETWEEN THE LATERALLY ADJACENT THIRD-LAYER CONTAINERS IN THE LOAD UNIT HAVING A CONTAINER IN THE FOURTH 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 17'-0" LONG STEEL STRAPPING (16 REQD). INSTALL TO ENCIRCLE THE CONTAINERS IN THE THREE-HIGH STACKS AND THE LOWER THREE CONTAINERS IN THE FOUR-HIGH STACK. SEE THE "UNITIZATION PROCEDURES" ON PAGE 3 FOR GUIDANCE.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 13'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE THIRD AND FOURTH LAYERS OF CONTAINERS IN THE FOUR-HIGH STACK.
- ⑦ REAR BLOCKING ASSEMBLY (1 REQD). SEE THE "REAR BLOCKING ASSEMBLY A" DETAIL ON PAGE 11. POSITION WITH THE FILL PIECES AGAINST THE CONTAINERS. SEE SPECIAL NOTE 4 ON PAGE 5.

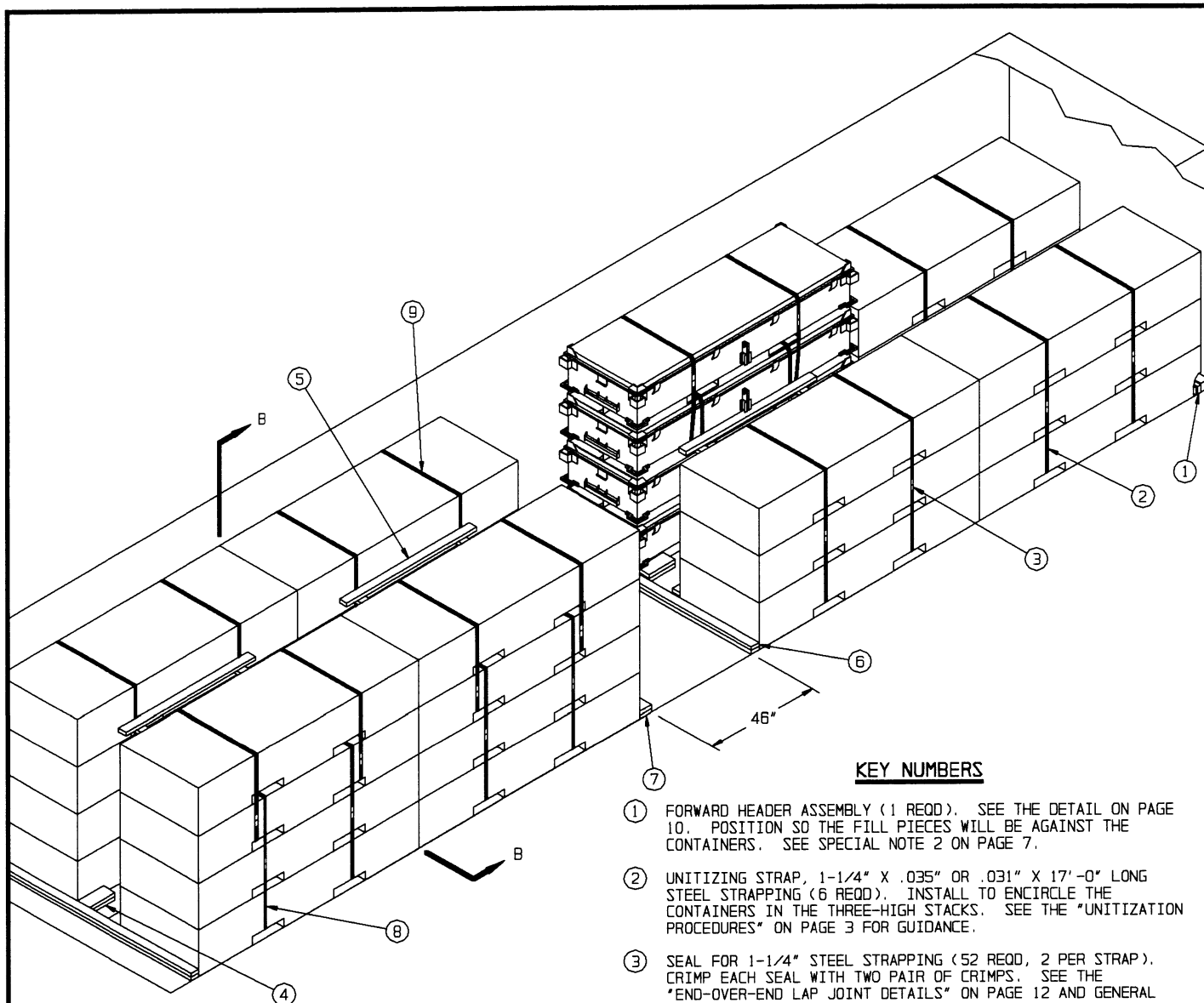
SPECIAL NOTES:

1. A 29-UNIT LOAD IS SHOWN IN A 45'-0" LONG BY 8'-2" WIDE (INSIDE DIMENSION) VAN TRAILER. 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 IN LIEU OF THE DEPICTED HEADER, PIECE MARKED ①. SEE THE DETAIL ON PAGE 10.
3. IF DESIRED IN TRAILERS HAVING A NAILABLE FLOOR, NAILED SIDE BLOCKING MAY BE USED IN LIEU OF THE ANTI-SWAY BRACES, PIECES MARKED ④, BETWEEN THE 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 WITH 3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST WITH 3-10d NAILS.
4. IF THE SPACE AT THE REAR OF THE LOAD, BETWEEN THE CONTAINERS AND THE REAR DOORS, MEASURES 1-1/2" OR LESS, REAR BLOCKING IS NOT REQUIRED. IF THE SPACE AT THE REAR OF THE LOAD IS MORE THAN 1-1/2" BUT LESS THAN 9", USE THE "REAR BLOCKING ASSEMBLY B" AS DETAILED ON PAGE 11. IF THE SPACE IS MORE THAN 9", USE THE "REAR BLOCKING ASSEMBLY A", AS SHOWN.
5. 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 ⑦. SEE PIECE MARKED ⑩ ON PAGE 6 FOR GUIDANCE.
6. THE DEPICTED LOAD CAN BE INCREASED BY ONE CONTAINER, IF DESIRED. THIRTY CONTAINERS CAN BE LOADED BY PLACING THE ADDED CONTAINER OPPOSITE THE FOURTH-LAYER CONTAINER IN THE REAR LOAD UNIT. SECURE WITH TWO PIECES MARKED ⑥. THIS PLACEMENT OF CONTAINERS IN THE TOP LAYER IS APPLICABLE FOR A "WESTERN" TYPE TRAILER WHICH HAS THE REAR TANDEMS AT THE EXTREME REAR OF THE TRAILER. FOR TRAILERS OTHER THAN THE "WESTERN" TYPE, THE FOURTH-LAYER CONTAINERS SHOULD BE PLACED IN THE SECOND LOAD UNIT FROM THE FRONT OF THE TRAILER. LOADS IN EITHER TYPE TRAILER ARE LIMITED TO NOT MORE THAN THIRTY CONTAINERS. THIS CONTAINER PLACEMENT IS NOT MANDATORY BUT IS PROVIDED AS GUIDANCE ONLY. CONTAINERS SHOULD BE PLACED SO AS TO OBTAIN THE BEST WEIGHT DISTRIBUTION.
7. 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 THIRD LAYER, PREFERABLY FROM THE FRONT PORTION OF THE LAYER.
8. IF A 48'-0" LONG TRAILER IS FURNISHED FOR LOADING, A MAXIMUM OF 29 CONTAINERS CAN BE LOADED. THREE LOAD UNITS OF FOUR CONTAINERS SHOULD BE LOADED AT THE FRONT OF THE TRAILER. PLACE AN ADDITIONAL CONTAINER ON THE THIRD LOAD UNIT AND SECURE AS SHOWN FOR THE FOURTH-LAYER CONTAINER IN THE LOAD ON PAGE 4. LOAD UNITS FOUR AND FIVE SHOULD EACH CONSIST OF EIGHT CONTAINERS. IF ONLY 28 CONTAINERS ARE TO BE SHIPPED, OMIT THE TOP CONTAINER FROM THE THIRD LOAD UNIT.
9. IF A 40'-0" LONG TRAILER IS FURNISHED FOR LOADING, REFER TO THE LOADING PROCEDURES ON PAGES 6 AND 7 FOR GUIDANCE.

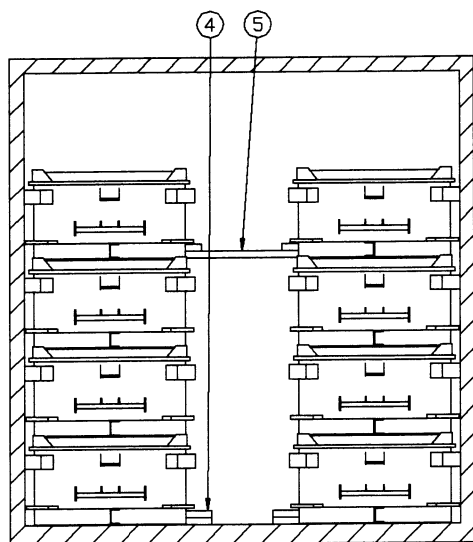
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3" (ACTUAL)	12	4
2" X 3" (ACTUAL)	12	8
2" X 4"	102	68
4" X 4"	35	47
NAILS	NO. REQD	POUNDS
6d (2")	16	1/4
10d (3")	88	1-1/4
16d (3-1/2")	16	1/2
STEEL STRAPPING, 1-1/4" - - 350' REQD - - - 50 LBS		
SEAL FOR 1-1/4" STRAPPING - - 44 REQD - - - 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER - - - - -	29 - - - - -	42,775 LBS
DUNNAGE - - - - -	- - - - -	308 LBS
TOTAL WEIGHT - - - - -		43,083 LBS (APPROX)



**ISOMETRIC VIEW**



**SECTION B-B**

**KEY NUMBERS**

- ① FORWARD HEADER ASSEMBLY (1 REQD.). SEE THE DETAIL ON PAGE 10. POSITION SO THE FILL PIECES WILL BE AGAINST THE CONTAINERS. SEE SPECIAL NOTE 2 ON PAGE 7.
- ② UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-0" LONG STEEL STRAPPING (6 REQD.). INSTALL TO ENCIRCLE THE CONTAINERS IN THE THREE-HIGH STACKS. SEE THE "UNITIZATION PROCEDURES" ON PAGE 3 FOR GUIDANCE.
- ③ SEAL FOR 1-1/4" STEEL STRAPPING (52 REQD., 2 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE THE "END-OVER-END LAP JOINT DETAILS" ON PAGE 12 AND GENERAL NOTE "J" 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 SPECIAL NOTE 3 ON PAGE 7.
- ⑤ ANTI-SWAY BRACE (3 REQD.). SEE THE DETAIL ON PAGE 10. INSTALL BETWEEN LATERALLY ADJACENT CONTAINERS IN THE FOURTH LAYER AND/OR BETWEEN LATERALLY ADJACENT THIRD-LAYER CONTAINERS IN THE LOAD UNIT HAVING A LONE CONTAINER IN THE FOURTH LAYER. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ⑥ FORWARD INTERMEDIATE HEADER, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD.). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/8-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4 ON PAGE 7.
- ⑦ REAR INTERMEDIATE HEADER, 2" X 6" BY TRAILER WIDTH MINUS 1/2" (DOUBLED) (1 REQD.). NAIL THE FIRST PIECE TO THE TRAILER FLOOR W/5-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST W/5-20d NAILS.
- ⑧ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-0" LONG STEEL STRAPPING (10 REQD.). INSTALL TO ENCIRCLE THE BOTTOM THREE CONTAINERS IN THE FOUR-HIGH STACKS. SEE THE "UNITIZATION PROCEDURES" ON PAGE 3 FOR GUIDANCE.
- ⑨ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 13'-0" LONG STEEL STRAPPING (10 REQD.). INSTALL TO ENCIRCLE THE THIRD AND FOURTH LAYERS OF CONTAINERS IN THE FOUR-HIGH STACKS.
- ⑩ REAR HEADER, 2" X 4" 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.

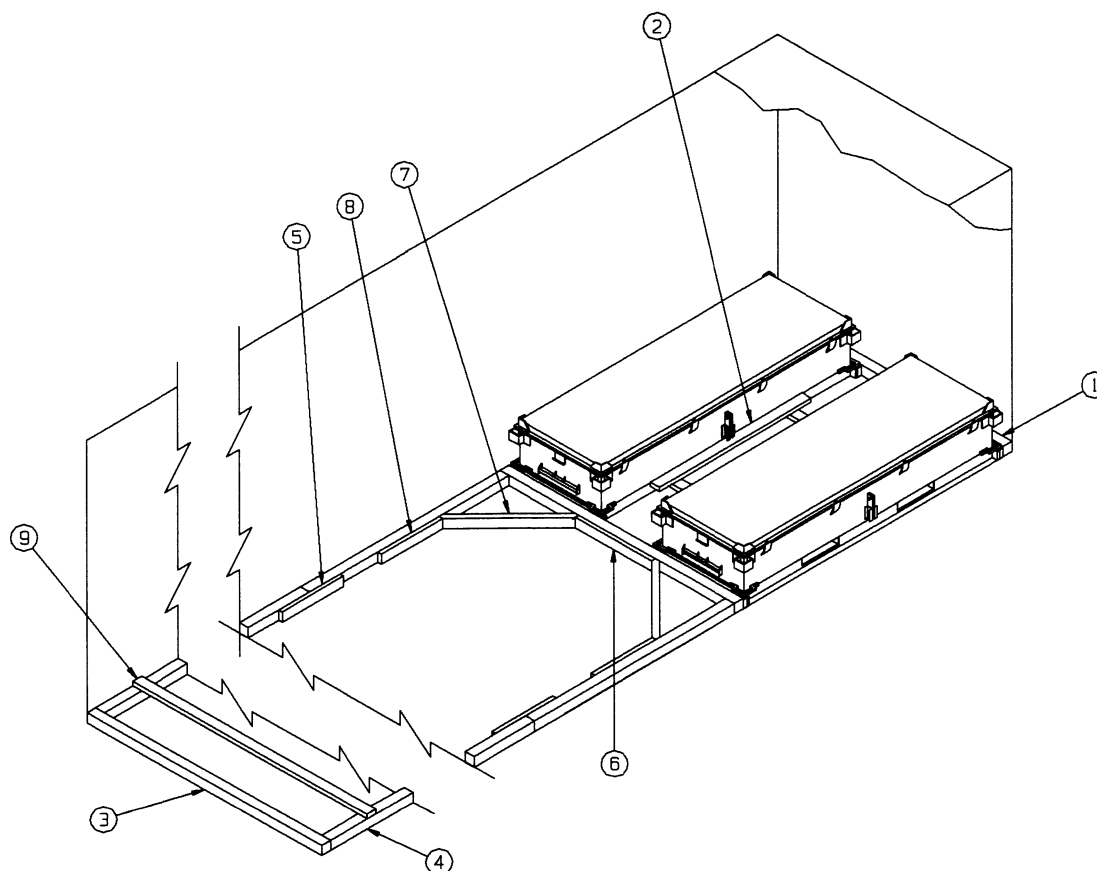
SPECIAL NOTES:

1. A 29-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 THRU 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 IN LIEU OF THE DEPICTED FORWARD HEADER, PIECE MARKED ①. SEE THE DETAIL ON PAGE 10.
3. IF THE TRAILER BEING LOADED DOES NOT HAVE A NAILABLE FLOOR, OR IF DESIRED, ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ⑤ 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. 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 ⑥ AND ⑦. SEE THE "SPACER ASSEMBLY" DETAIL ON PAGE 11.
5. 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 ⑩. 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 11. IF THE SPACE IS MORE THAN 9", USE THE "REAR BLOCKING ASSEMBLY A", AS DETAILED ON PAGE 11. IF THE SPACE IS LESS THAN 1-1/2", REAR BLOCKING IS NOT REQUIRED.
6. THE DEPICTED LOADING PATTERN IS APPLICABLE FOR "WESTERN" TYPE TRAILERS WHICH HAVE THE REAR TANDEM LOCATED AT THE EXTREME REAR OF THE TRAILER. IF THE TRAILER TO BE LOADED IS OTHER THAN THE "WESTERN" TYPE, OMIT PIECES MARKED ⑥ AND ⑦, OR THE SPACER ASSEMBLY IF IT IS USED, AND POSITION THE CONTAINER LOAD UNITS AGAINST EACH OTHER.
7. THE DEPICTED LOAD CAN BE INCREASED BY ONE CONTAINER, IF DESIRED. THIRTY CONTAINERS, A MAXIMUM LOAD, CAN BE SHIPPED BY PLACING THE ADDED CONTAINER OPPOSITE THE FOURTH-LAYER CONTAINER IN THE SECOND LOAD UNIT. SECURE WITH TWO PIECES MARKED ⑨. 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. 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 OF THE SECOND LOAD UNIT. ADDITIONAL REDUCTION CAN BE ACCOMPLISHED BY OMITTING CONTAINERS FROM THE BALANCE OF THE FOURTH LAYER.
9. 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"	82	55
2" X 6"	48	48
4" X 4"	8	11
NAILS	NO. REQD	POUNDS
10d (3")	173	2-3/4
20d (4")	5	1/4
STEEL STRAPPING, 1-1/4" - - 402' REQD - - - 58 LBS		
SEAL FOR 1-1/4" STRAPPING - - 52 REQD - - - 3 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER	29	42,775 LBS
DUNNAGE		292 LBS
TOTAL WEIGHT		43,067 LBS (APPROX)



**ISOMETRIC VIEW**

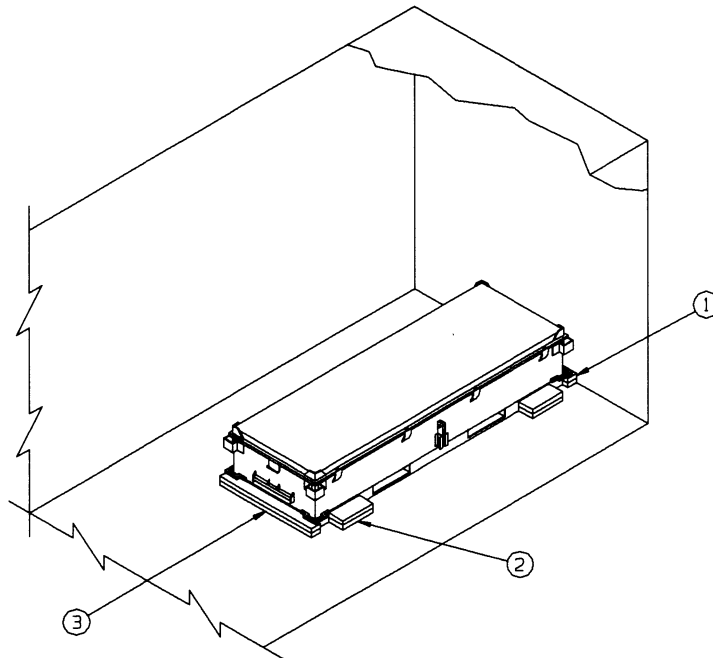
**SPECIAL NOTES:**

1. A 2-UNIT LOAD IS SHOWN IN A 7'-8" WIDE VAN TRAILER. OTHER WIDTH TRAILERS MAY BE USED.
2. A TRAILER EQUIPPED WITH A SQUARE FRONT WALL IS SHOWN. IF THE TRAILER TO BE LOADED HAS ROUNDED FRONT CORNERS, A "FORWARD BLOCKING ASSEMBLY" MUST BE USED IN LIEU OF THE DEPICTED FORWARD HEADER ASSEMBLY, PIECE MARKED ①. SEE THE DETAIL ON PAGE 10.
3. ALL LTL LOADS, REGARDLESS OF THEIR SIZE, REQUIRE ONE STRUT BRACE POSITIONED AT THE REAR OF THE TRAILER AND NAILED TO PIECES MARKED ④. IF THE SIDE STRUTS, PIECES MARKED ④, ARE LONGER THAN 7'-0", AN ADDITIONAL STRUT BRACE, PIECE MARKED ⑨, MUST BE APPLIED FOR EVERY 7'-0" OF SIDE STRUT LENGTH.
4. THE K-BRACE BLOCKING, SHOWN AS PIECES MARKED ③ THRU ⑨, IS ADEQUATE FOR RETAINING A MAXIMUM OF SEVENTEEN 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 THRU ⑨. SEE PIECE MARKED ⑩ ON PAGE 6 FOR A TYPICAL INSTALLATION. THE HEADER WILL BE NAILED WITH NOT LESS THAN 6-10d NAILS IN EACH LAYER. A HEADER WITH 6 NAILS IS ADEQUATE FOR AN LTL LOAD OF NOT MORE THAN TEN CONTAINERS. FOR EACH ADDITIONAL CONTAINER, ADD A 10d NAIL IN EACH LAYER OF THE HEADER.

**KEY NUMBERS**

- ① FORWARD HEADER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 10. POSITION AT BOTH ENDS OF THE CONTAINERS WITH THE FILL PIECES AGAINST THE CONTAINERS. 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 REAR HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD).
- ④ SIDE STRUT, 4" X 4" BY CUT TO FIT BETWEEN THE FORWARD HEADER ASSEMBLY, PIECE MARKED ①, AND THE REAR HEADER, PIECE MARKED ③ (2 REQD). TOENAIL TO PIECES MARKED ① AND ③ W/2-16d NAILS AT EACH END.
- ⑤ SPLICE PIECE, 2" X 4" X 24" (AS REQD). CENTER ON A JOINT OF A SIDE STRUT, PIECE MARKED ④, AND NAIL W/4-10d NAILS AT EACH END.
- ⑥ CENTER CLEAT, 2" X 4" X 30" (1 REQD). NAIL TO A FORWARD HEADER ASSEMBLY, PIECE MARKED ①, W/7-10d NAILS.
- ⑦ DIAGONAL BRACE, 2" X 4" BY CUT TO FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND TOENAIL TO A FORWARD HEADER ASSEMBLY AND TO A SIDE STRUT, PIECES MARKED ① AND ④, W/2-16d NAILS AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 4" X 24" (2 REQD). NAIL TO A SIDE STRUT, PIECE MARKED ④, W/8-10d NAILS.
- ⑨ STRUT BRACE, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (MINIMUM OF ONE REQUIRED). POSITION NEAR THE REAR OF THE TRAILER AND NAIL TO THE SIDE STRUTS, PIECES MARKED ④, W/3-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 AT LEFT.





ISOMETRIC VIEW

SPECIAL NOTES:

1. A 1-UNIT LOAD IS SHOWN IN A 7'-8" WIDE (INSIDE DIMENSION) VAN TRAILER WHICH HAS A NAILABLE FLOOR. OTHER WIDTH TRAILERS 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 10.
3. THE HEADER, SHOWN AS PIECE MARKED ③, WILL NOT BE RELIED UPON TO RETAIN MORE THAN FIVE 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 MARKED ②, 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 HEADER, 2" X 4" X 36" (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 2 AT LEFT.
- ② SIDE BLOCKING, 2" X 6" X 12" (DOUBLED) (4 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.
- ③ HEADER, 2" X 4" X 36" (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 BELOW.

HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD). 3/4" X 45° BEVEL CUT ON EACH END OF THE HEADER CAN BE MADE IF DEEMED APPROPRIATE.

SPACER PIECES, 2" X 4" MATERIAL (AS REQD). POSITION ON EDGE AND NAIL THE FIRST PIECE TO THE HEADER W/4-10d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.

FILL PIECE, 2" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO THE HEADER W/4-10d NAILS.

FILL PIECE, 1" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A 2" X 4" FILL PIECE W/4-6d NAILS.

### FORWARD BLOCKING ASSEMBLY

HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD).

TRAILER WIDTH MINUS 1/2"

FILL PIECE, 1" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A 2" X 4" FILL PIECE W/4-6d NAILS.

### FORWARD HEADER ASSEMBLY

FILL PIECE, 2" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO THE HEADER W/4-10d NAILS.

FABRICATE TO FIT BETWEEN LATERALLY ADJACENT CONTAINERS.

FABRICATE TO FIT (REF: 50").

RETAINER PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION TO EXTEND UNDER THE LATERALLY ADJACENT CONTAINERS AND THRU THE FORK TINE OPENINGS.

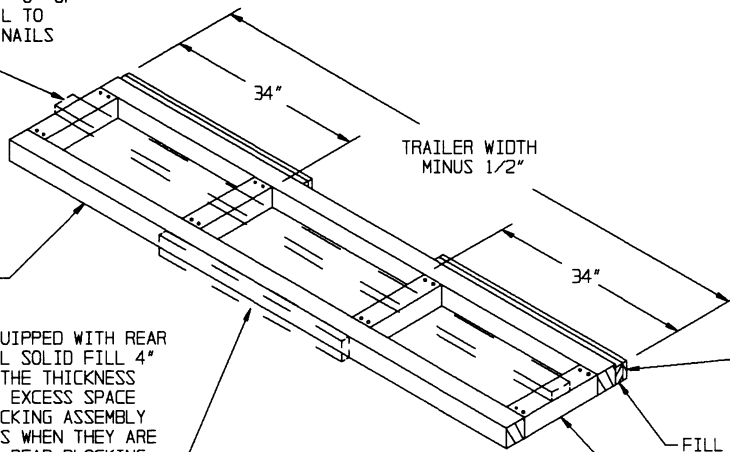
BUFFER PIECE, 2" X 4" X 60" (2 REQD). POSITION AGAINST THE CONTAINER AND NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

### ANTI-SWAY BRACE

STRUT BRACING, 2" X 4" BY TRAILER WIDTH MINUS 1/2" (1 REQD FOR EVERY 7'-0" OF STRUT LENGTH). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

HEADER, 4" X 4" BY TRAILER WIDTH MINUS 1/2" (2 REQD).

IF THE TRAILER IS EQUIPPED WITH REAR CORNER POSTS, INSTALL SOLID FILL 4" WIDE BY 36" LONG BY THE THICKNESS REQUIRED TO FILL THE EXCESS SPACE BETWEEN THE REAR BLOCKING ASSEMBLY AND THE TRAILER DOORS WHEN THEY ARE CLOSED. NAIL TO THE REAR BLOCKING ASSEMBLY W/3 APPLICABLY SIZED NAILS.



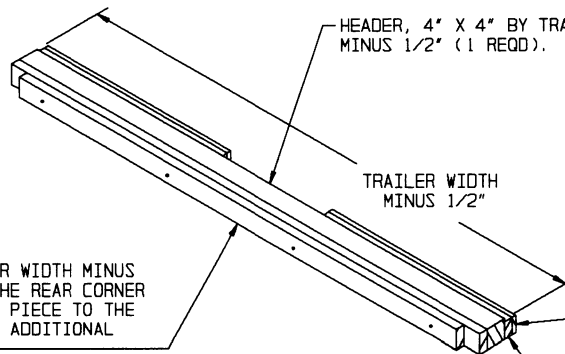
FILL PIECE, 1" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A 2" X 3" FILL PIECE W/4-6d NAILS.

FILL PIECE, 2" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A HEADER W/4-10d NAILS.

STRUT, 4" X 4" BY A LENGTH TO SUIT (4 REQD). TOENAIL TO THE HEADER W/2-16d NAILS AT EACH END.

### REAR BLOCKING ASSEMBLY A

FOR A SPACE AT THE REAR OF A LOAD OF 9' OR MORE.



FILL MATERIAL, 2" X 4" BY TRAILER WIDTH MINUS 1/2" AND/OR CUT TO FIT BETWEEN THE REAR CORNER POSTS (AS REQD). NAIL THE FIRST PIECE TO THE HEADER W/4-10d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.

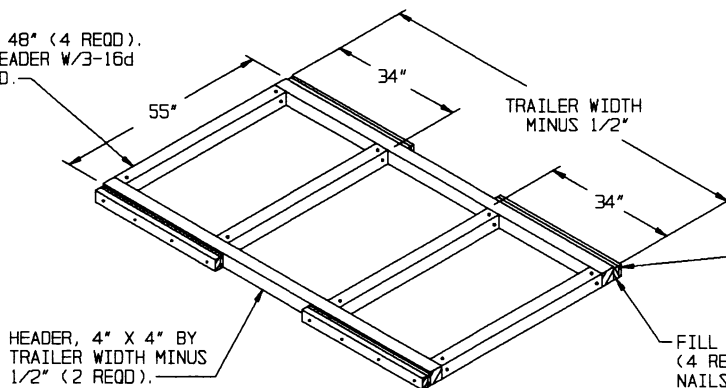
FILL PIECE, 1" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A 2" X 3" FILL PIECE W/4-6d NAILS.

FILL PIECE, 2" X 3" (ACTUAL) X 36" (2 REQD). NAIL TO A HEADER W/4-10d NAILS.

### REAR BLOCKING ASSEMBLY B

FOR A SPACE AT THE REAR OF A LOAD OF LESS THAN 9'.

STRUT, 4" X 4" X 48" (4 REQD). TOENAIL TO THE HEADER W/3-16d NAILS AT EACH END.



FILL PIECE, 1" X 3" (ACTUAL) X 36" (4 REQD). NAIL TO A 2" X 3" FILL PIECE W/4-6d NAILS.

FILL PIECE, 2" X 3" (ACTUAL) X 36" (4 REQD). NAIL TO A HEADER W/4-10d NAILS.

### SPACER ASSEMBLY

### DETAILS



ONE SEAL WITH  
TWO PAIR OF  
NOTCHES.



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