

APPROVED
 BUREAU OF EXPLOSIVES
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 MILITARY ASSISTANT
 DATE 4/13/67

LOADING & BRACING (TL & LTL) IN CLOSED OR OPEN TOP VAN TRAILERS OF CBU ITEMS PACKED IN THE CNU-85/E CONTAINER

INDEX

<u>ITEM</u>	<u>PAGE(S)</u>
GENERAL NOTES, AND MATERIAL SPECIFICATIONS -----	2
UNITIZATION AND HANDLING PROCEDURES -----	3
TL (38-UNIT LOAD) -----	4, 5
TYPICAL LTL (11-UNIT LOAD) -----	6
DETAILS -----	7

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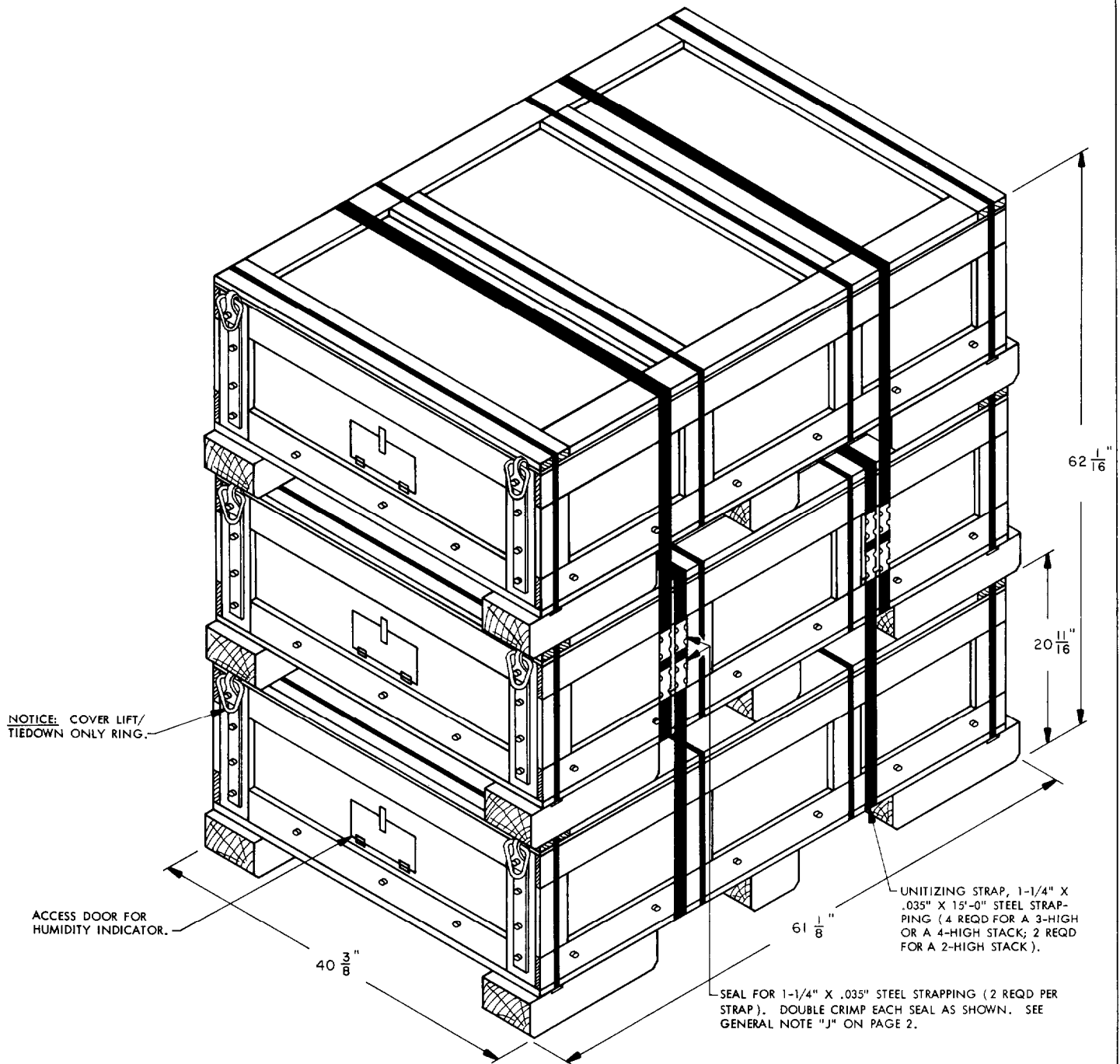
DO NOT SCALE

GENERAL NOTES

- A. THE 38-UNIT LOAD SHOWN ON PAGE 4 IS BASED ON A CLOSED OR OPEN TOP VAN TRAILER 38'-0" LONG BY 7'-6" WIDE (INSIDE DIMENSION) HAVING A WOOD OR A WOOD AND METAL, OR A METAL FLOOR. THE DELINEATED OUTLOADING PROCEDURES ARE ALSO APPLICABLE TO LONGER TRAILERS AND TO TRAILERS WHICH ARE FROM 86 INCHES TO 93 INCHES WIDE. ALSO, A 38-UNIT LOAD CAN BE OUTLOADED IN SHORTER TRAILERS; A 28'-0" LONG TRAILER BEING THE MINIMUM LENGTH TRAILER WHICH WILL CONTAIN 38 UNITS. TO FACILITATE THE USE OF A SHORTER TRAILER, THE CONTAINERS MAY BE STACKED AND UNITIZED INTO 4-HIGH STACKS AS REQUIRED. REFERRING TO THE "TYPICAL STACK DETAIL" ON PAGE 3, THE LOWER SET OF UNITIZING STRAPS SHOULD BE PLACED AROUND THE LOWER THREE CONTAINERS WHEN FORMING A 4-HIGH STACK UNIT.
- B. THE OUTLOADING PROCEDURES SPECIFIED HEREIN ARE APPLICABLE TO CBU ITEMS WHEN THEY ARE PACKAGED IN THE CNU-85/E CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER HEREIN MEANS THE CNU-85/E CONTAINER WITH CONTENTS.
- C. FOR DETAILS OF THE CONTAINER SEE DRAWING NO. 9206179.
CONTAINER DIMENSIONS --- 61-1/8" LONG X 40-3/8" WIDE X 20-11/16" HIGH.
GROSS WEIGHT ----- 1,025 POUNDS (APPROX).
- D. 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.
- E. THE NUMBER OF UNITS MAY BE ADJUSTED TO FIT THE SIZE OF TRAILER TO BE LOADED OR THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS SHOWN HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING AND STAYING OF THE DESIGNATED ITEMS.
- F. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE EMPTY OR LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEMS DESIGNATED WITHIN THE DRAWING TITLE. FOR A SHIPMENT OF EMPTY CONTAINERS, ONLY ONE SET OF TWO UNITIZING STRAPS NEED BE USED ON EACH STACK.
- G. OTHER TYPES OF LADING ITEMS MAY BE LOADED INTO TRAILERS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEMS, 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.
- H. ONE AND ONE-QUARTER INCH (1-1/4") STEEL STRAPPING WILL BE USED TO UNITIZE STACKED CONTAINERS AS SHOWN ON PAGE 3. IT IS RECOMMENDED THAT CONTAINERS BE UNITIZED PRIOR TO PLACEMENT ABOARD A TRAILER, PROVIDING THE CAPACITY OF THE AVAILABLE MATERIALS HANDLING EQUIPMENT PERMITS. NOTICE: IN SOME INSTANCES CONTAINERS WILL ALREADY BE UNITIZED INTO STACKS WHEN OFFERED FOR LOADING. THESE UNITIZED STACKS SHOULD BE INSPECTED AND AS REQUIRED, LOOSE UNITIZING STRAPS MUST BE REPLACED.
- J. WHEN ANY STACK UNITIZING STRAP IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS WITH TWO (2) CRIMPS PER SEAL MUST BE USED FOR EACH JOINT. CAUTION: EXERCISE CARE DURING STRAP TENSIONING TO PREVENT DAMAGE TO CONTAINERS; TENSIONING SHOULD ONLY BE SUFFICIENT TO CAUSE A STRAP TO CRUSH A SLIGHT AMOUNT INTO THE EDGES OF THE CONTAINERS.
- K. FOR TRAILERS NOT EQUIPPED WITH REAR CORNER POSTS, REAR BLOCKING MUST BE EXTENDED TO CONTACT THE REAR DOORS WHEN THEY ARE CLOSED.
- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 4" MATERIAL IS ACTUALLY 3/4" THICK BY 3-5/8" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-5/8" THICK BY 3-5/8" WIDE.
- M. PORTIONS OF THE SEMITRAILER BODIES DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS ONE OF THE SIDE WALLS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- N. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3 AND TO THE DELINEATED OUTLOADING METHODS CONTAINED HEREIN.

MATERIAL SPECIFICATIONS

- LUMBER ----- : SEE TM 715-5500-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS ----- : COMMON, CEMENT COATED OR CHEMICALLY ETCHED; FED SPEC FF-N-105.
ALT: ANNULAR-RING TYPE NAIL OF SAME SIZE.
- STRAPPING, STEEL: TYPE I OR IV, CLASS A OR B; FED SPEC QQ-5-781.
FOR FSN SEE SB-38-100.
- WIRE ----- : FED SPEC QQ-W-461.



TYPICAL STACK DETAIL

(PROCEDURAL GUIDANCE CONTINUED)

**UNITIZING AND HANDLING
PROCEDURAL GUIDANCE**

1. STACKING CONTAINERS FOR UNITIZING.
 - A. AN UPPER CONTAINER SHOULD BE PLACED AS CLOSE AS POSSIBLE IN VERTICAL ALIGNMENT WITH THE NEXT LOWER CONTAINER.
 - B. POSITION THE ACCESS DOOR END OF AN UPPER CONTAINER ABOVE THE ACCESS DOOR END OF THE NEXT LOWER CONTAINER.
2. INSTALLATION OF 1-1/4" X .035" UNITIZING STEEL STRAPPING. SEE GENERAL NOTE "H" ON PAGE 2.
 - A. EACH OF THE TWO SETS OF UNITIZING STRAPS SHOULD BE POSITIONED AROUND THE CONTAINERS AS SHOWN. PLACE STRAPPING NEAR THE INSIDE ENDS OF THE LONG CONTAINER SKIDS AND SO THAT THE STRAPPING LAYS FLAT AND STRAIGHT WITH THE BODY SURFACES OF THE CONTAINERS; I.E., VERTICAL ALONG SIDES AND STRAIGHT ACROSS THE TOP AND BOTTOM OF THE CONTAINERS.
 - B. STRAPPING WILL BE FIRMLY TENSIONED, AND EACH END-OVER-END LAP JOINT WILL BE SEALED WITH TWO DOUBLE CRIMPED STRAP SEALS AS SHOWN. SEE GENERAL NOTE "J" ON PAGE 2. THE LAP JOINTS WILL BE MADE ALONG THE SIDE OF THE STACK SO THAT THE SEALS WILL NOT BE IN CONTACT WITH THE CONTAINERS. EXCESS STRAPPING (STRAP ENDS) SHOULD BE CUT OFF OR BROKEN OFF NEAR THE JOINT SEALS.
3. CONTAINER OR CONTAINER STACK HANDLING.

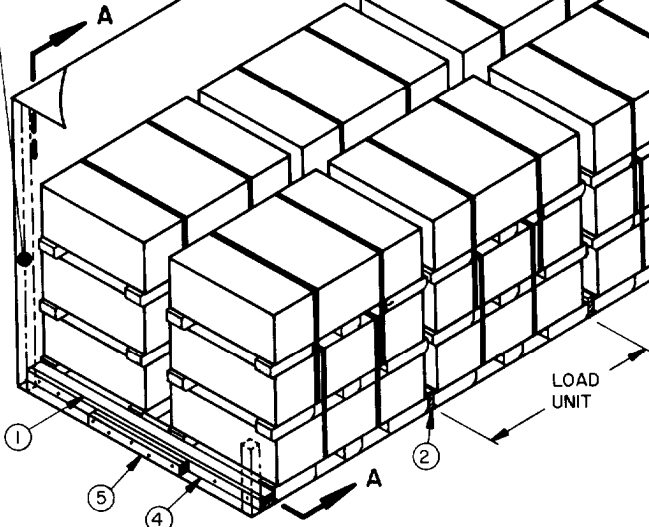
NOTES: (1) APPROVED MATERIALS HANDLING EQUIPMENT (FORKLIFT TRUCKS, CRANES, HAND TRUCKS, DOLLIES, ROLLER ASSEMBLIES, SLINGS, SPREADER BARS, ETC.) IS SPECIFIED ELSEWHERE.

(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 MAY BE HANDLED FROM AN END OR SIDE POSITION; THE LATTER BEING THE PREFERRED POSITION. CARE MUST BE EXERCISED WHEN INSERTING FORKS UNDER A CONTAINER, TO PREVENT DAMAGING A CONTAINER BY THE FORK TINES OR THE FORKLIFT PACKAGE GUARD. FOR VERY SHORT "INCHING" SPEED MOVEMENTS, SUCH AS WILL BE EXPERIENCED DURING TRAILER LOADING OPERATIONS, A UNITIZED STACK MAY BE HANDLED BY INSERTING THE FORKS OF A FORKLIFT TRUCK UNDER THE BODY OF AN UPPER CONTAINER.
 - C. EVEN IF ONLY ONE CONTAINER IS HANDLED BY SLINGING, THE SLING MUST BE OF SUCH A DESIGN THAT THE LIFTING IS DONE ON THE BOTTOM OF THE CONTAINER. **CAUTION:** DO NOT ATTACH A SLING TO THE CONTAINER "COVER LIFT/TIEDOWN" DEVICES ON THE ENDS OF THE CONTAINERS. IF A UNITIZED STACK IS HANDLED BY SLINGING, THE SLING USED MUST BE OF SUCH A DESIGN THAT THE LIFTING IS DONE ON THE BOTTOM OF THE LOWEST CONTAINER.

FOR A ROUND-FRONT OR A ROUNDED-CORNER TRAILER, SEE THE "FORWARD BLOCKING" DETAILS ON PAGE 7.

REAR CORNER POST OF TRAILER. SEE GENERAL NOTE "K" ON PAGE 2.



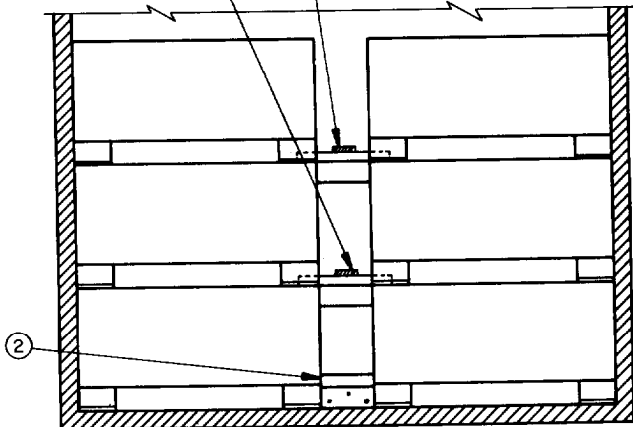
ISOMETRIC VIEW
SEE THE "SPECIAL NOTES" ON PAGE 5.

KEY NUMBERS

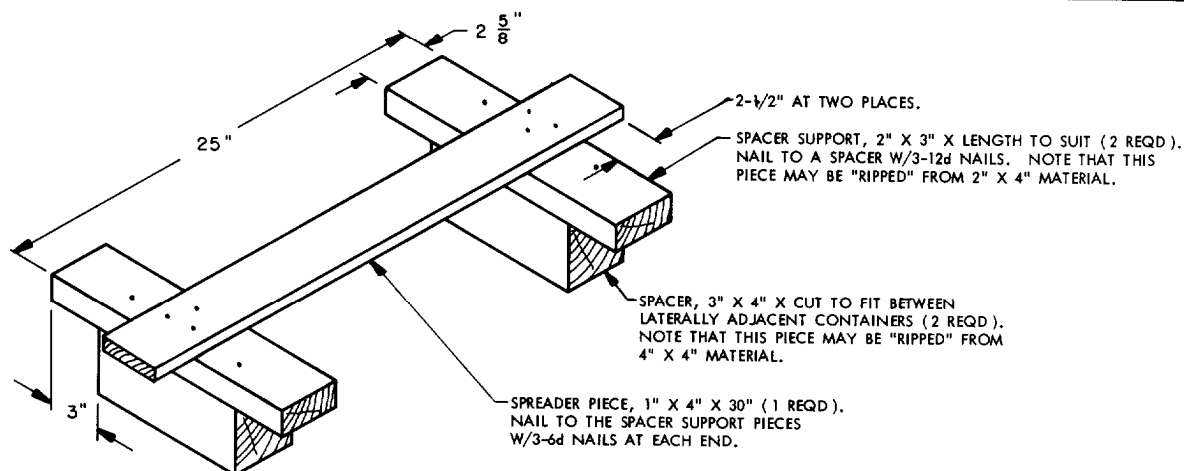
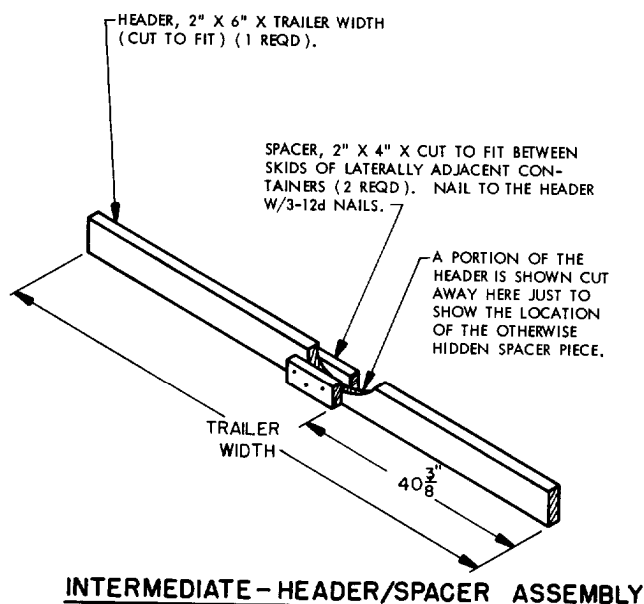
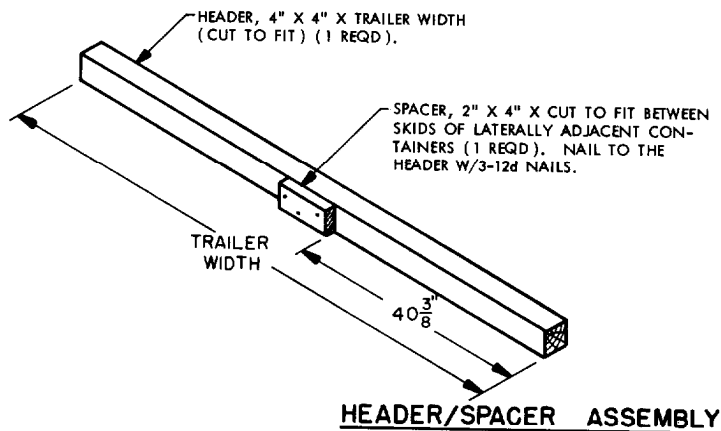
- ① HEADER/SPACER ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. NOTE: REFER TO THE "FORWARD BLOCKING" DETAILS ON PAGE 7. FOR APPLICABLE GUIDANCE IF THE TRAILER BEING LOADED HAS A ROUNDED FRONT WALL OR ROUNDED CORNERS AT THE FORWARD END.
- ② INTERMEDIATE HEADER/SPACER ASSEMBLY (6 REQD). SEE DETAIL ON PAGE 5. POSITION BETWEEN LONGITUDINALLY ADJACENT LOAD UNITS.
- ③ ANTI-SWAY BRACE ASSEMBLY (7 REQD). SEE DETAIL ON PAGE 5. POSITION AS SPECIFIED BY THE "SECTION A-A" VIEW.
- ④ SOLID FILL, 4" WIDE MATERIAL BY TRAILER WIDTH IN LENGTH. LAMINATE TO THE ADJACENT PIECE MARKED ① AND/OR TOGETHER W/7-12d NAILS. SEE THE "ALTERNATIVE REAR BLOCKING ASSEMBLY" DETAIL ON PAGE 7, AND GENERAL NOTE "K" ON PAGE 2. THE ALTERNATIVE TYPE OF REAR BLOCKING IS REQUIRED IN LIEU OF THE SOLID FILL MATERIAL WHEN THE SPACE BETWEEN THE REAR OF THE LOAD AND THE REAR DOORS OF THE TRAILER WHEN THEY ARE CLOSED IS 12" OR MORE.
- ⑤ SOLID FILL, 4" WIDE BY 36" LONG BY THE THICKNESS REQUIRED TO FILL THE EXCESS SPACE BETWEEN THE PIECE MARKED ④ AND REAR DOORS OF THE TRAILER WHEN THEY ARE CLOSED. POSITION AS SHOWN AND NAIL TO THE PIECE MARKED ④ AND/OR TOGETHER W/5-12d NAILS. THIS SOLID FILL DUNNAGE IS NOT REQUIRED FOR TRAILERS WHICH DO NOT HAVE REAR CORNER POSTS.
- ⑥ STEEL STRAPPING, 1-1/4" X .035" X 15'-0" (48 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3, AND GENERAL NOTES "H" AND "J" ON PAGE 2.
- ⑦ SEAL FOR 1-1/4" STRAPPING (% REQD; 2/STRAP JOINT). DOUBLE CRIMP EACH SEAL.

LOCATION FOR PIECES MARKED ③ WHICH ARE BLOCKING 2-HIGH CONTAINER STACKS.

LOCATION FOR PIECES MARKED ③ WHICH ARE BLOCKING 3-HIGH OR 4-HIGH CONTAINER STACKS.



SECTION A-A



ANTI-SWAY BRACE ASSEMBLY

NOTE: THIS ASSEMBLY CANNOT BE COMPLETELY ASSEMBLED PRIOR TO INSTALLING WITHIN A LOAD. AT LEAST ONE END OF THE SPREADER PIECE WILL HAVE TO BE NAILED AFTER THE OTHER ASSEMBLED PIECES ARE PLACED INTO A BLOCKING POSITION BETWEEN TWO LATERALLY ADJACENT CONTAINER STACKS.

SPECIAL NOTES:

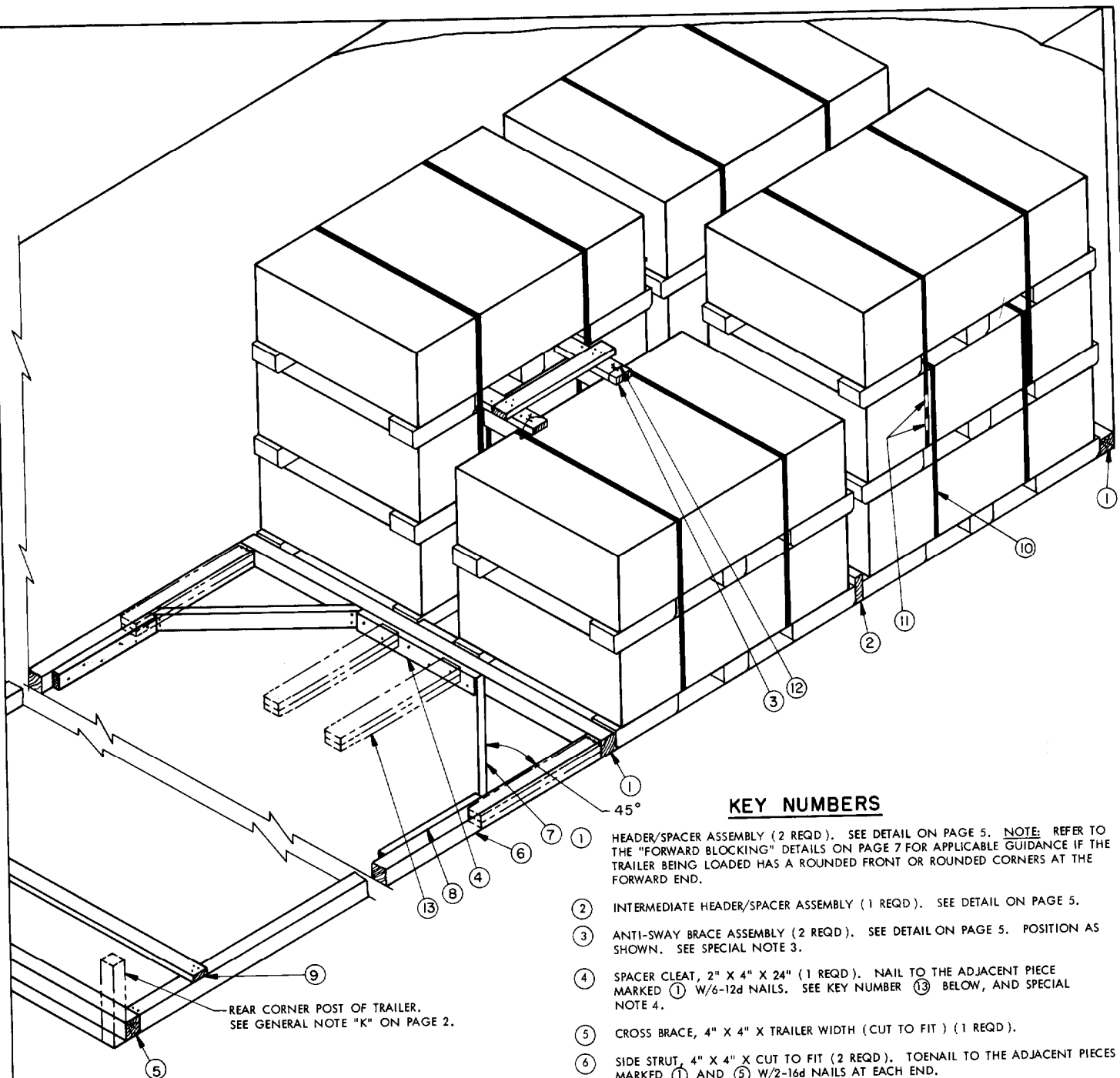
1. A 38'-0" LONG BY 7'-6" WIDE LONG TRAILER IS SHOWN, HOWEVER, A DIFFERENT SIZE TRAILER CAN BE USED; SEE GENERAL NOTE "A" ON PAGE 2.
2. THE DEPICTED LOAD CONFIGURATION MAY BE ADJUSTED TO SATISFY THE QUANTITY OF ITEMS TO BE SHIPPED IN A TRAILER BY ADDING ONE OR MORE CONTAINERS TO THE 2-HIGH CONTAINER STACKS OR BY REDUCING ONE OR MORE 3-HIGH STACKS TO A 2-HIGH CONFIGURATION. IF A 2-HIGH AND A 3-HIGH STACK ARE LATERALLY ADJACENT TO EACH OTHER, REFER TO THE LTL PROCEDURES ON PAGE 6 FOR THE TIE METHOD REQUIRED FOR SECURING THE ANTI-SWAY BRACE ASSEMBLY.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	18	6
2" X 3"	18	9
2" X 4"	24	16
2" X 6"	45	45
3" X 4"	11	11
4" X 4"	15	20
NAILS	NO REQD	POUNDS
6d (2")	42	1/4
12d (3-1/4")	101	1-3/4
STEEL STRAPPING, 1-1/4" X .035" --- 720' REQD		103 LBS
SEAL FOR 1-1/4" STRAPPING ----- % REQD		5 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
CONTAINER ----- (W/CBU ITEM)	38	38,950 LBS
DUNNAGE -----		270 LBS
TOTAL WEIGHT ---		39,220 LBS



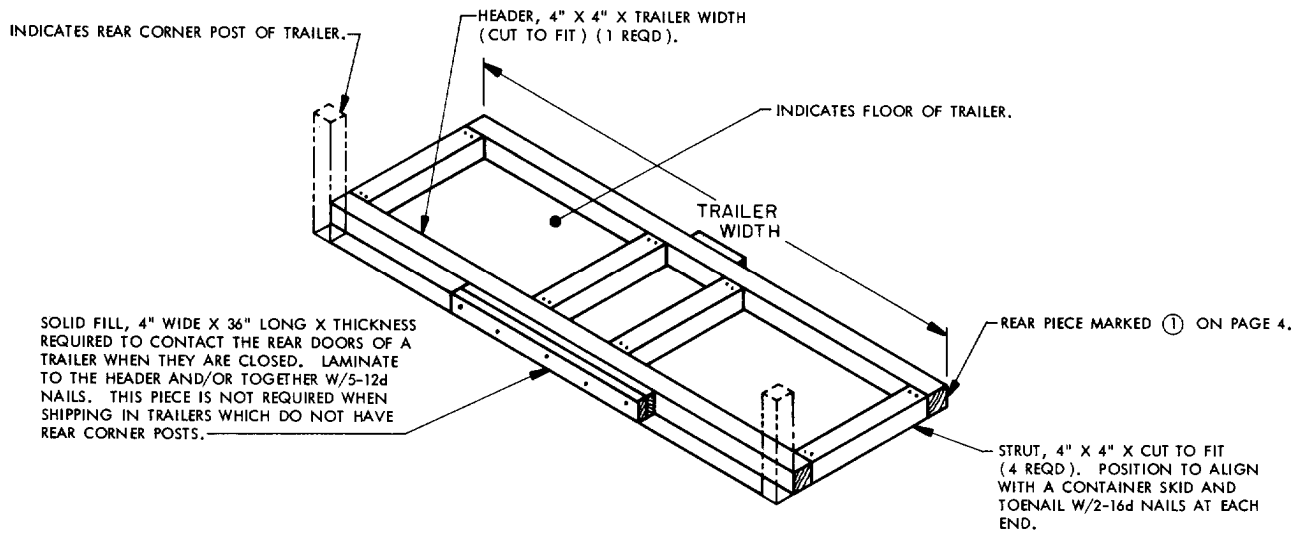
TYPICAL LTL

SPECIAL NOTES:

1. THESE LTL OUTLOADING PROCEDURES ARE SHOWN DEPICTING THE USE OF "K-BRACE" AND "NAILED FLOOR LINE" BLOCKING IN A 7'-6" WIDE TRAILER. WIDER OR NARROWER TRAILERS CAN ALSO BE USED.
2. THE "K-BRACE" BLOCKING, SHOWN AS PIECES MARKED ④ THROUGH ⑨, IS ADEQUATE FOR RETAINING A MAXIMUM SIZE LTL LOAD OF 24,000 POUNDS.
3. A BRACE TIE WIRE SHOULD BE INSTALLED TO LOOSELY ENCIRCLE A SPACER SUPPORT PIECE OF THE ANTI-SWAY BRACE AND A CONTAINER STACK UNITIZING STRAP AS SHOWN. THE ENDS OF THE WIRE ARE TO BE TWISTED TOGETHER, BUT NOT SO TIGHT AS TO DEFORM THE UNITIZING STRAP, AND A 6d NAIL WILL BE DRIVEN PARTIALLY INTO THE ANTI-SWAY BRACE AND BENT OVER THE TIE WIRE TO PREVENT DISPLACEMENT OF THE WIRE DURING TRANSIT.
4. PIECES MARKED ⑬ ARE FOR USE IN A TRAILER WHICH HAS A NAILABLE FLOOR AND SHOULD BE USED IF POSSIBLE, IN LIEU OF PIECES MARKED ④ THROUGH ⑨ WHICH APPLY TO TRAILERS HAVING NON-NAILABLE FLOORS. FOUR (4) BACK-UP CLEATS, SHOWN AS PIECES MARKED ⑬, ARE ADEQUATE FOR RETAINING A MAXIMUM SIZE LTL LOAD OF 20,000 POUNDS.

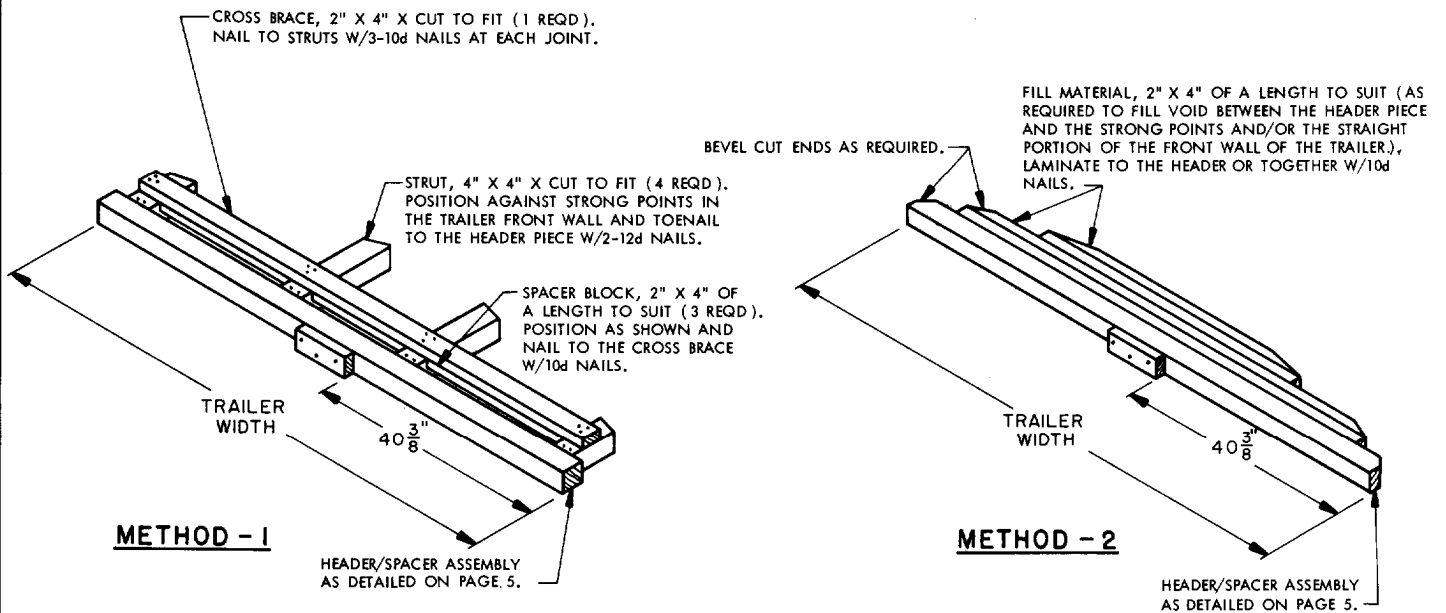
KEY NUMBERS

- ① HEADER/SPACER ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. NOTE: REFER TO THE "FORWARD BLOCKING" DETAILS ON PAGE 7 FOR APPLICABLE GUIDANCE IF THE TRAILER BEING LOADED HAS A ROUNDED FRONT OR ROUNDED CORNERS AT THE FORWARD END.
- ② INTERMEDIATE HEADER/SPACER ASSEMBLY (1 REQD). SEE DETAIL ON PAGE 5.
- ③ ANTI-SWAY BRACE ASSEMBLY (2 REQD). SEE DETAIL ON PAGE 5. POSITION AS SHOWN. SEE SPECIAL NOTE 3.
- ④ SPACER CLEAT, 2" X 4" X 24" (1 REQD). NAIL TO THE ADJACENT PIECE MARKED ① W/6-12d NAILS. SEE KEY NUMBER ⑬ BELOW, AND SPECIAL NOTE 4.
- ⑤ CROSS BRACE, 4" X 4" X TRAILER WIDTH (CUT TO FIT) (1 REQD).
- ⑥ SIDE STRUT, 4" X 4" X CUT TO FIT (2 REQD). TOENAIL TO THE ADJACENT PIECES MARKED ① AND ⑤ W/2-16d NAILS AT EACH END.
- ⑦ DIAGONAL BRACE, 2" X 4" X CUT TO FIT (2 REQD). DOUBLE BEVEL EACH END WITH 45° CUTS. INSTALL AT A 45° ANGLE AS SHOWN AND NAIL TO THE ADJACENT PIECES MARKED ① AND ⑥ W/2-16d NAILS AT EACH END.
- ⑧ SIDE CLEAT, 2" X 4" X 24" (2 REQD). NAIL TO A PIECE MARKED ⑥ W/6-12d NAILS.
- ⑨ STRUT BRACING, 2" X 4" X TRAILER WIDTH (CUT TO FIT) (MINIMUM OF 1 REQD). ONE (1) ADDITIONAL BRACE IS REQUIRED FOR EVERY 7'-0" OF STRUT LENGTH. NAIL TO THE PIECES MARKED ⑥ W/3-12d NAILS AT EACH END.
- ⑩ STEEL STRAPPING, 1-1/4" X .035" X 15'-0" (14 REQD). SEE THE "UNITIZATION AND HANDLING PROCEDURES" ON PAGE 3, AND GENERAL NOTES "H" AND "J" ON PAGE 2.
- ⑪ SEAL FOR 1-1/4" STRAPPING (28 REQD; 2/STRAP JOINT). DOUBLE CRIMP EACH SEAL.
- ⑫ BRACE TIE WIRE, NO. 8 GAGE BLACK ANNEALED WIRE 18" LONG AND 6d NAIL (2 REQD). SEE SPECIAL NOTE 3.
- ⑬ BACK-UP CLEAT, 2" X 4" X 30" (DOUBLED) (4 REQD). ALIGN WITH CONTAINER SKIDS AND NAIL FIRST PIECE TO TRAILER FLOOR W/7-12d NAILS. NAIL SECOND PIECE TO FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4.



ALTERNATIVE REAR BLOCKING ASSEMBLY

NOTE: THIS TYPE OF REAR BLOCKING IS REQUIRED WHEN THE EXCESS SPACE AT THE REAR OF THE LADING MEASURES 12" OR MORE.



FORWARD BLOCKING

NOTE: THIS TYPE OF BLOCKING IS FOR USE IN TRAILERS WHICH HAVE ROUNDED FRONTS OR ROUNDED CORNERS AT THE FORWARD END. THE METHOD WHICH BEST SUITS EXISTING CONDITIONS SHOULD BE SELECTED. CONTOUR OF TRAILER FRONT WALL, CONTACTING POINTS OF LADING VERSUS STRONG POINTS OF TRAILER FRONT WALL AND SO FORTH SHOULD BE CONSIDERED.