APPROVED BY
BUREAU OF EXPLOSIVES
DATE 10/27/92

LOADING AND BRACING (CL & LCL) IN BOX CARS OF COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS ON 4 WAY ENTRY PALLET

M 152 SERIES CONTAINER

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THIS OUTLOADING PROCEDURE DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOX CARS, BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES OF VARIOUS DESIGN AND MANUFACTURE, AND CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

THIS DRAWING SUPERSEDES U.S. ARMY MATERIEL COMMAND DRAWING 19-48-4079-1-2-5-11-14PM1001, DATED SEPTEMBER 1969, AS PERTAINS TO THE CARLOADING OF THE M152 SERIES CONTAINERS.

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DRAFTSMAN	TYPIST	CHECKER	TECHNICIAN	ENGINEER
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APPROVED BY U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND

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U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL

U.S. ARMY MATERIEL COMMAND
DECEMBER 1992

CLASS	DIVISION	DRAWING	FILE
19	48	4212/4	5PM 1003

PROJECT CA 2254-85

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 THE M152 SERIES COMPLETE ROUND CONTAINER WHEN UNITIZED ON A 35" X 45-1/2" FOUR WAY ENTRY PALLET. SEE THE PICTORIAL VIEW ON PAGE 3. REFER TO THE U.S. ARMY MATERIEL COMMAND (AMC) DRAWING 19-48-4079/4-20PM1002 FOR UNITIZATION PROCEDURES FOR THE M152 SERIES CONTAINERS.

C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

D. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET UNITS OF PROPELLING CHARGES IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.

E. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 110 FOR GUIDANCE.

F. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.

G. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THEN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.

H. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLETIZED UNITS OF PROPELLING CHARGES, 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. MIXED ITEMS TO BE SHIPPED IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MUST BE SEPARATELY BLOCKED, USING THE PROCEDURES SHOWN FOR THESE CARS AS GUIDANCE.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER: SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751

NAILS: COMMON, FED SPEC FF-N-105

STRAPPING, STEEL: ASTM D 3953; FLAT STRAPPING, TYPE I OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.

STRAP SEAL: ASTM D 3953; CLASS H, FINISH A, B (GRADE 2), OR C, TYPE D, STYLE I, II, OR IV.

STRAP STAPLE: COMMERCIAL GRADE.

PLYWOOD: GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.

WIRE: FED SPEC QQ-W-461

HARDBOARD: ANSI/AHA A135.4 CLASS 1.

SOLID FIBERBOARD: FED SPEC PP-F-320. TYPE SF, CLASS DOMESTIC, GRADE 175 OR STRONGER; OR TYPE SF, CLASS WEATHER-RESISTANT, GRADE W6S OR STRONGER.

(GENERAL NOTES CONTINUED)

J. 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. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAILS.

K. 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 OR SIDEWALL 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 OR SIDEWALL 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 ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.

L. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CAR 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" 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 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.

M. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) 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 116 FOR GUIDANCE.

N. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.

O. 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 0.454KG.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

P. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "M" ABOVE.

Q. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.

R. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

(GENERAL NOTES CONTINUED)

S. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 41 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.

T. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED IF DESIRED.

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

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

V. THE OUTLOADING PROCEDURES FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES. HOWEVER, FIXED OR ADJUSTABLE WALL MEMBERS AND DOORWAY MEMBERS WITHIN THESE CARS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. CAUTION: BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.

1. FOR BLOCKING THE LOAD WHICH IS DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSE. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE MEMBER ARE OFF-CENTER. NOTE: IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).

2. CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT---ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.

W. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.

X. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

Y. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.

Z. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF COMPLETE ROUNDS. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONED DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.

AA. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED. HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE

(CONTINUED AT RIGHT)

(GENERAL NOTES CONTINUED)

BB. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.

CC. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED BY GENERAL NOTE "DD-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 50.

DD. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLET UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.

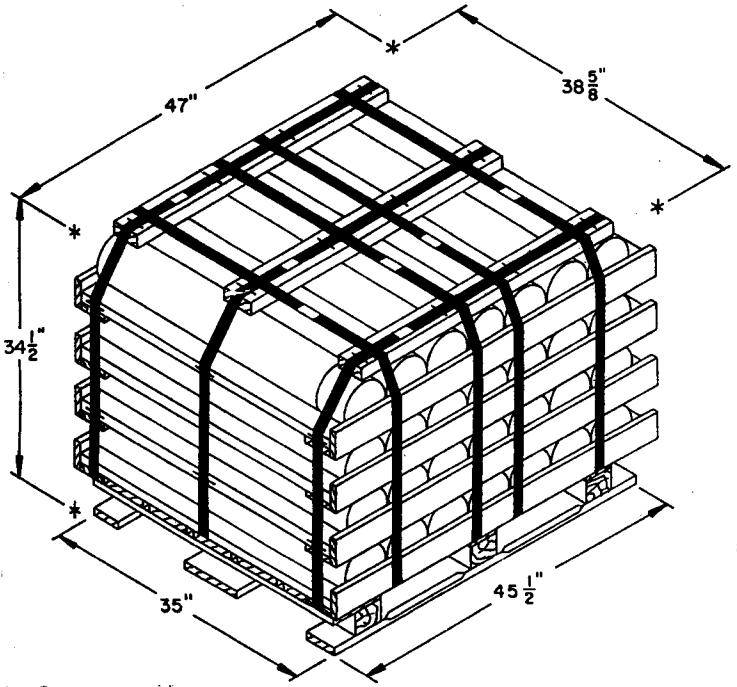
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 22 AND 23.

2. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 20 OR 21 FOR GUIDANCE.

3. AT LOCATION (5) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD IN A ONE-HIGH LOADING PATTERN. INSTALL CENTER GATES AND STRUTS AS SHOWN ON PAGE 4 OR 6 OF THE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.

4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 36 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 32.

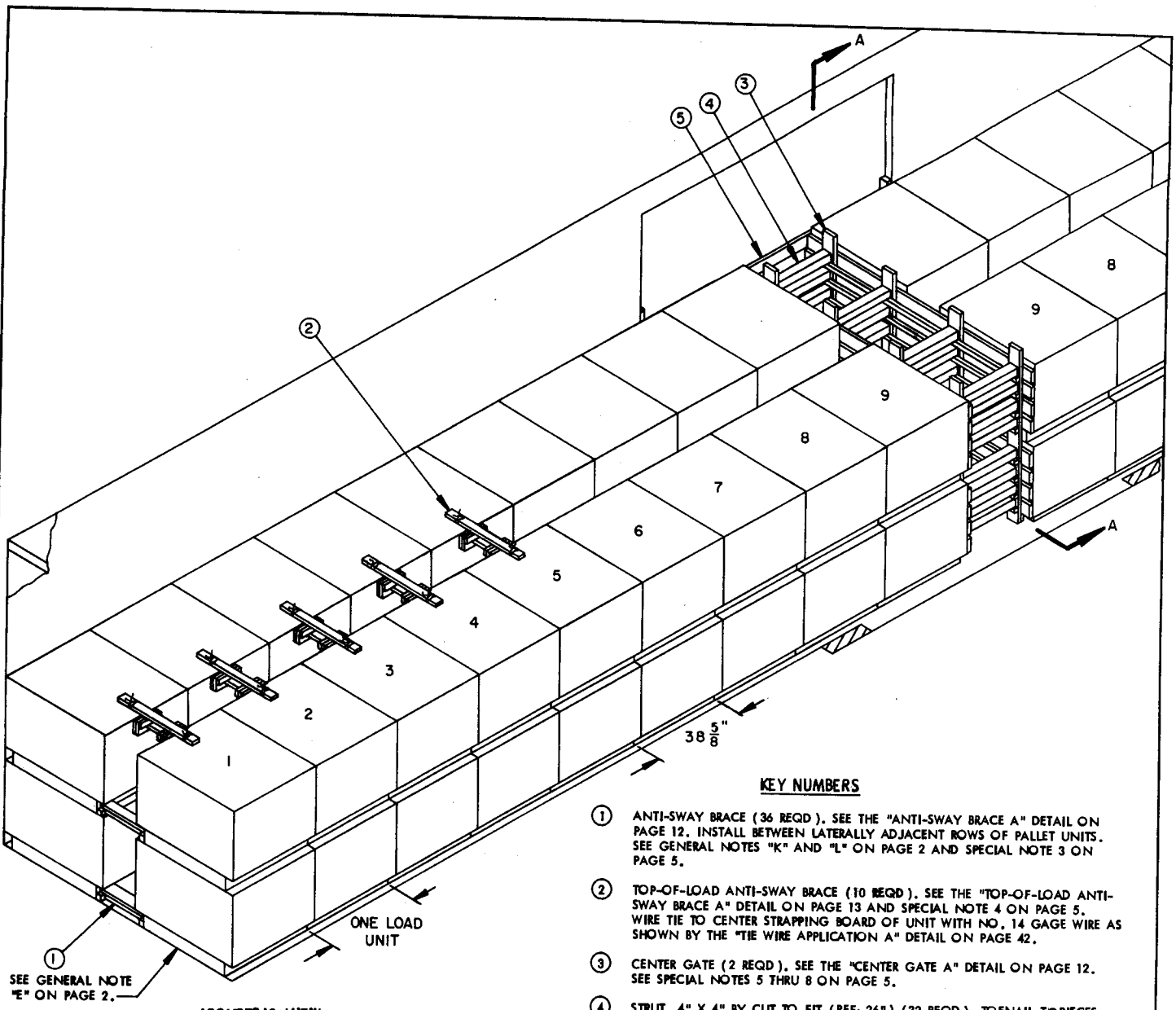
EE. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.



THE "TYPICAL TYPE A" VIEW ON PAGE 49 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 49, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

PALLET UNIT

CONTAINER ---------- 28 EACH @ 71 LBS (APPROX)
CUBE ---------- 36.2 CUBIC FEET (APPROX)
GROSS WEIGHT ---------- 2,147 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

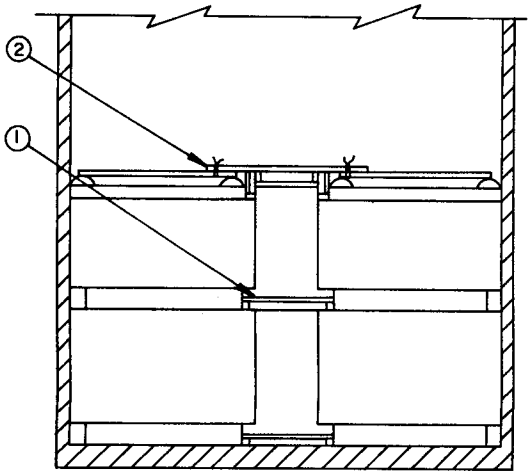
(1) ANTI-SWAY BRACE (36 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 12. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 5.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13 AND SPECIAL NOTE 4 ON PAGE 5. WIRE TIE TO CENTER STRAPPING BOARD OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42.

(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12. SEE SPECIAL NOTES 5 THRU 8 ON PAGE 5.

(4) STRUT, 4" X 4" BY CUT TO FIT (REF: 26") (32 REQD). TOENAIL TOPIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J" AND "R" ON PAGE 2 AND GENERAL NOTE "S" ON PAGE 3. SEE SPECIAL NOTE 9 ON PAGE 5.

(5) DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 12. SEE SPECIAL NOTE 10 ON PAGE 5.



SECTION A-A

CONTAINERS LENGTHWISE
72-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 39 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.

2. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 120,232 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR, OR A MAXIMUM OF FORTY-FOUR (44) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 94,468 POUNDS, WHEN USING THE DEPICTED PROCEDURES.

3. IF THE "ALTERNATIVE DOORWAY PROTECTION E" PROCEDURES AS SHOWN ON PAGE 48 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 4, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE STRAPPING BOARD WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; FOUR (4) ARE REQUIRED IN EACH END OF A LOAD IN 40'-6" AND 50'-6" LONG CARS.

5. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 45 FOR GUIDANCE.

6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 4, INSTALL TWO (2) "CENTER GATES E" AS SHOWN ON PAGE 44. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 45.

7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 43 FOR GUIDANCE.

8. FOR EASE OF INSTALLATION, THE STRUT LEDGERS ON ONE GATE SHOULD BE INSTALLED AS CONSTRUCTION PROGRESSES. THERE IS NOT ENOUGH ROOM VERTICALLY TO PERMIT DRIVING THE STRUT INTO PLACE IF ALL THE LEDGERS ARE INSTALLED AHEAD OF TIME.

9. WHEN LOADING A 50'-6" OR A 40'-6" LONG CAR, A REDUCED NUMBER OF STRUTS MAY BE USED. THE CENTER GATE "A" MAY BE MODIFIED BY OMITTING THE HORIZONTAL PIECES AT THE 17" AND 51-1/2" LEVELS AND THE STRUT LEDGERS AT THE 12-1/2" AND 47" LEVELS. ALSO OMIT THE FOUR (4) STRUTS, PIECE MARKED (4), AT THAT LEVEL.

10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 4, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 46 THRU 48 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 48 FOR GUIDANCE. NOTE THAT NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. NOTE THAT STRUT BRACING WILL BE REQUIRED WHEN A LOAD UNIT IS OMITTED. SEE THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 41 FOR GUIDANCE. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 16 THRU 36 FOR GUIDANCE.

12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 38 FOR SHIPPING GUIDANCE.

(CONTINUED AT LEFT)

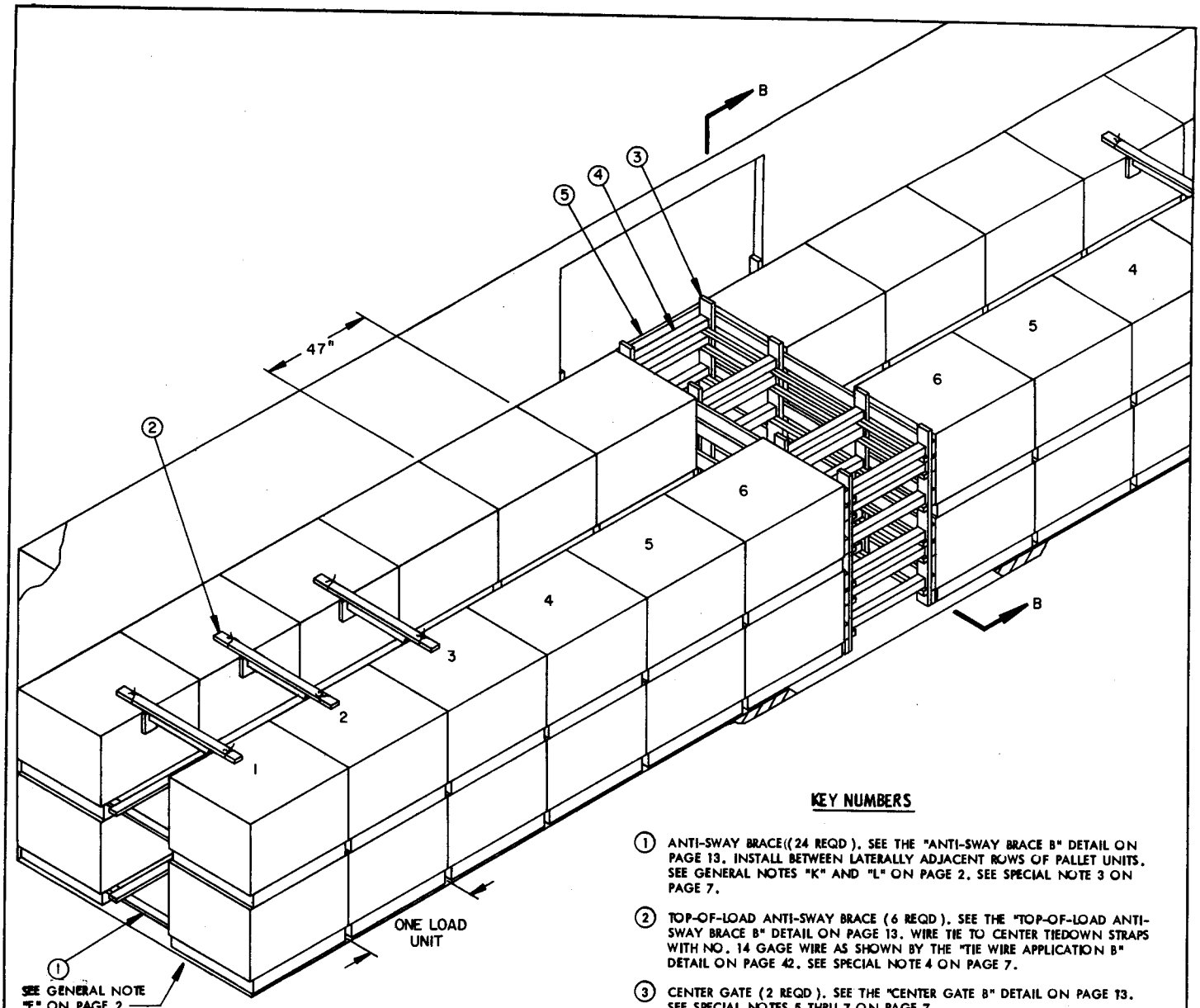
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	157	53
1" X 6"	80	40
2" X 2"	368	123
2" X 3"	46	23
2" X 4"	193	129
2" X 6"	207	207
4" X 4"	70	94
NAILS	**NO. REQD**	**POUNDS**
6d (2")	672	4
10d (3")	660	10-1/4
12d (3-1/4")	244	4-1/4
16d (3-1/2")	128	3
WIRE; NO. 14 GAGE	50' REQD	1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	72	154,584 LBS
DUNNAGE		1,362 LBS
TOTAL WEIGHT		155,946 LBS

CONTAINERS LENGTHWISE
72-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



ISOMETRIC VIEW

KEY NUMBERS

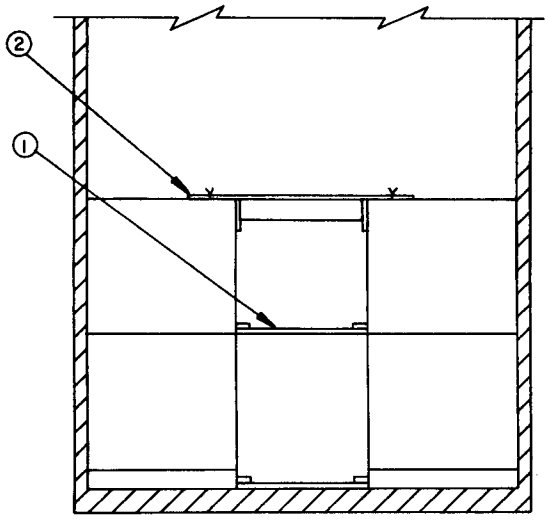
(1) ANTI-SWAY BRACE((24 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 13. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 7.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 13. WIRE TIE TO CENTER TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 42. SEE SPECIAL NOTE 4 ON PAGE 7.

(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 13. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 7.

(4) STRUT, 4" X 4" BY CUT TO FIT (REF: 36") (24 REQD). TOENAIL TO PIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J" AND "R" ON PAGE 2 AND GENERAL NOTE "S" ON PAGE 3. SEE SPECIAL NOTE 8 ON PAGE 7.

(5) DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 12. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 7.



SECTION B-B

CONTAINERS CROSSWISE
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.

2. A MAXIMUM OF SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 128,820 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-SIX (36) UNITS CAN BE LOADED IN A 40'-6" LONG CAR, FOR AN APPROXIMATE LADING WEIGHT OF 77,292 POUNDS, WHEN USING THE DEPICTED PROCEDURES.

3. IF THE DOORWAY PROTECTION PROCEDURES AS SHOWN BY PIECES MARKED (3) THRU (6) ON PAGE 10 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 42. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN EITHER A 50'-6" OR A 40'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.

5. CENTER GATE "B" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 45 FOR GUIDANCE.

6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE B", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 6, INSTALL TWO (2) CENTER GATES "F" AS SHOWN ON PAGE 44. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 45.

7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO THE CENTER GATE "B" PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 43 FOR GUIDANCE.

8. WHEN LOADING A 40'-6" LONG CAR, A REDUCED NUMBER OF STRUTS MAY BE USED. THE CENTER GATE "B" MAY BE MODIFIED BY OMITTING THE HORIZONTAL PIECES AT THE 23" AND 57-1/2" LEVELS AND THE STRUT LEDGERS AT THE 18-1/2" AND 53" LEVELS. ALSO OMIT THE FOUR (4) STRUTS, PIECE MARKED (4), AT THAT LEVEL.

9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 46 THRU 48 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED (3) THRU (6) ON PAGE 10 FOR GUIDANCE. NOTE THAT NAILED FLOOR LINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 16 THRU 36 FOR GUIDANCE.

11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 37 FOR SHIPPING GUIDANCE.

12. FOR SHIPMENTS OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 39 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	64	32
2" X 2"	110	37
2" X 3"	24	12
2" X 4"	385	257
2" X 6"	182	182
4" X 4"	72	96
NAILS	**NO. REQD**	**POUNDS**
6d (2")	48	1/2
10d (3")	568	8-3/4
12d (3-1/4")	120	2
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ---------- 24' REQD ---------- 1/2 LB		

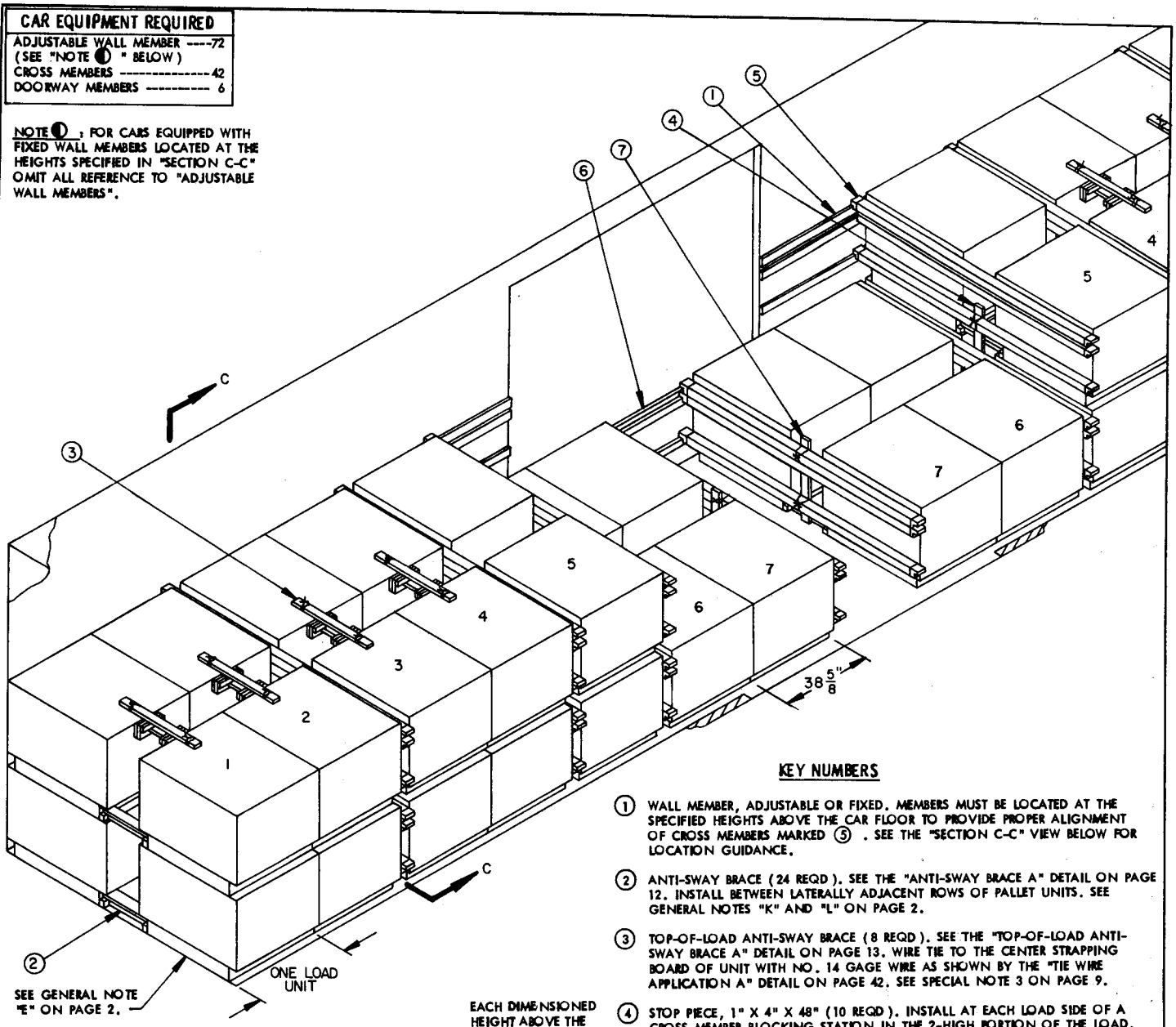
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	103,056 LBS
DUNNAGE		1,246 LBS
TOTAL WEIGHT		104,302 LBS

CONTAINERS CROSSWISE
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBER (SEE "NOTE ◐ " BELOW)	72
CROSS MEMBERS	42
DOORWAY MEMBERS	6

NOTE ◐ ; FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION C-C" OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



ISOMETRIC VIEW

KEY NUMBERS

① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤ . SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE.

② ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 12. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

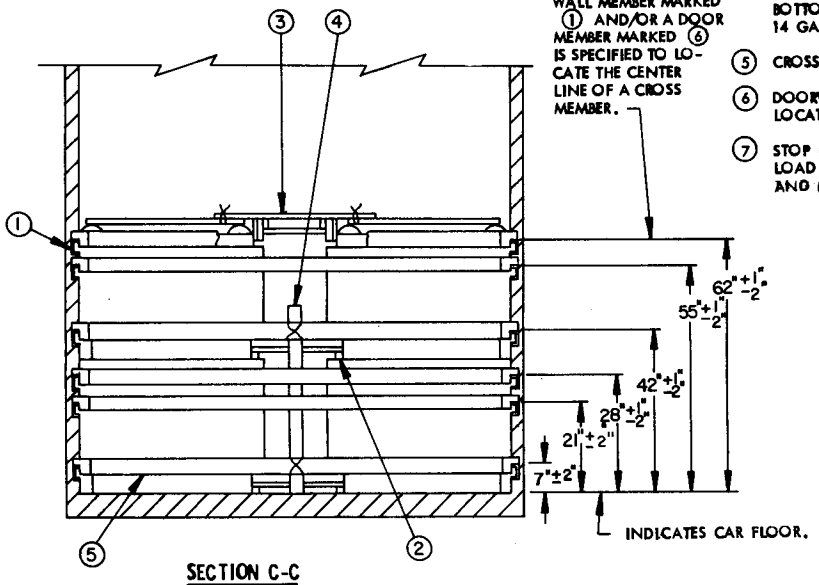
③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13. WIRE TIE TO THE CENTER STRAPPING BOARD OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42. SEE SPECIAL NOTE 3 ON PAGE 9.

④ STOP PIECE, 1" X 4" X 48" (10 REQD). INSTALL AT EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION IN THE 2-HIGH PORTION OF THE LOAD. NAIL TO THE CROSS BRACE OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON NEAR SIDE OF CROSS MEMBERS, WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE.

⑤ CROSS MEMBER (42 REQD). SEE GENERAL NOTE "V" ON PAGE 3.

⑥ DOORWAY MEMBER (6 REQD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 4 ON PAGE 9.

⑦ STOP PIECE, 1" X 4" X 36" (4 REQD). INSTALL IN 1-HIGH PORTIONS AT EACH LOAD SIDE OF CROSS MEMBER. WIRE TIE TO THE CROSS MEMBERS AT TOP AND BOTTOM OF STOP PIECE WITH NO. 14 GAGE WIRE.



SECTION C-C

CONTAINERS LENGTHWISE

48-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS AND 10'-0" WIDE DOOR OPENING IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.

2. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "E" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CENTER STRAPPING BOARD WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE-WIRE APPLICATION A" DETAIL ON PAGE 42. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING A 40'-6" OR A 50'-6" LONG CAR; FIVE (5) ARE REQUIRED IN EACH END IF LOADING A 60'-8" LONG CAR.

4. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AN ADDITIONAL EIGHT PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.

5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 14 AND 15 FOR GUIDANCE.

6. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 39 FOR GUIDANCE.

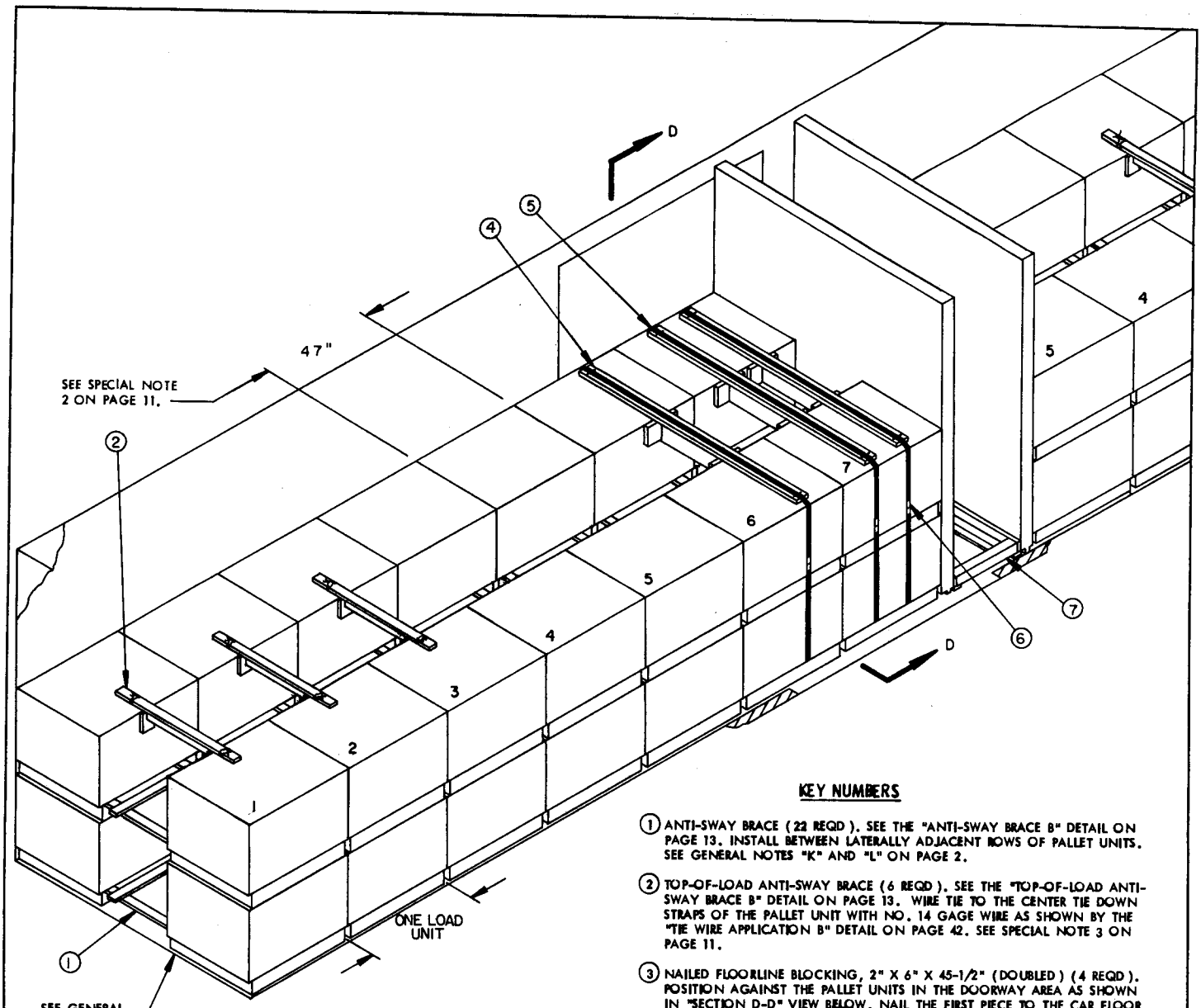
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	152	51
2" X 2"	155	52
2" X 3"	12	6
2" X 4"	120	80
NAILS	**NO. REQD**	**POUNDS**
6d (2")	456	2-3/4
10d (3")	368	5-3/4
WIRE, NO. 14 GAGE ---------- 100' REQD ---------- 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS	48	103,056 LBS
DUNNAGE		389 LBS
TOTAL WEIGHT		103,445 LBS

48-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



ISOMETRIC VIEW

KEY NUMBERS

(1) ANTI-SWAY BRACE (22 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 13. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 13. WIRE TIE TO THE CENTER TIE DOWN STRAPS OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 42. SEE SPECIAL NOTE 3 ON PAGE 11.

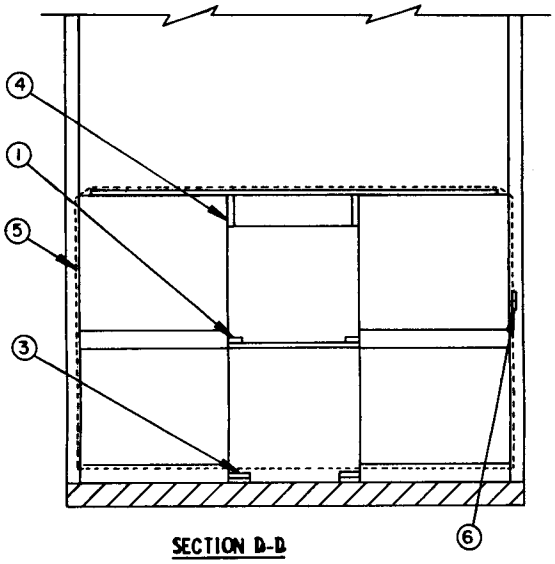
(3) NAILED FLOORLINE BLOCKING, 2" X 6" X 45-1/2" (DOUBLED) (4 REQD). POSITION AGAINST THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN IN "SECTION D-D" VIEW BELOW. NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 4 ON PAGE 11. SEE GENERAL NOTE "P" ON PAGE 2.

(4) SPACER ASSEMBLY (3 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 48.

(5) DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 31'-0" LONG STEEL STRAPPING (3 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS AND SPACER ASSEMBLY IN THE DOORWAY AREA. STAPLE TO THE SPACER ASSEMBLY W/2 STAPLES. SEE SPECIAL NOTE 4 ON PAGE 11.

(6) SEAL FOR 1-1/4" STEEL STRAPPING (6 REQD). DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "M" ON PAGE 2.

(7) STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR A 1-PIECE BULKHEAD" DETAIL ON PAGE 50. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 5 ON PAGE 11.



SECTION D-D

48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "Y" THRU "E-E" ON PAGE 3.

2. A MAXIMUM OF FIFTY-SIX (56) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 120,232 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-SIX (36) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 77,292 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF DESIRED, THE PALLET UNITS MAY BE LOADED WITH THE CONTAINERS ON THE UNIT LENGTHWISE IN THE CAR IN LIEU OF CROSSWISE AS SHOWN. IN THAT ORIENTATION, A MAXIMUM OF SIXTY-EIGHT (68) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 145,996 POUNDS, CAN BE LOADED IN A 60'-8" LONG CAR, FIFTY-SIX (56) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 120,232 POUNDS, AND FORTY-FOUR (44) UNITS FOR AN APPROXIMATE LADING WEIGHT OF 94,468 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR WHEN USING A COMBINATION OF THE PROCEDURES ON PAGE 10 AND THOSE ON PAGE 4.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE TIEDOWN STRAPS OF THE UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 42. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN EITHER A 50'-6" OR A 40'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR WHEN THE UNITS ARE LOADED WITH THE CONTAINERS ON THE UNIT CROSSWISE IN THE CAR. IF THE UNITS ARE POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR, FIVE (5) BRACES WILL BE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR AND FOUR (4) WILL BE REQUIRED IN EACH END OF EITHER A 50'-6" OR 40'-6" LONG CAR.

4. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH OR WIDTH. THE DEPICTED DOORWAY PROTECTION IS APPLICABLE FOR CARS EQUIPPED WITH EITHER SLIDING TYPE OR PLUG TYPE DOORS, OR A COMBINATION THEREOF. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING TYPE DOORS, WOODEN DOOR GATES SHOWN AS PIECE MARKED (5) ON PAGE 6 OR ANY OF THE ALTERNATIVES ON PAGES 46 THRU 48 MAY BE USED.

5. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED (7) IN THE LOAD ON PAGE 10, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED PALLET UNIT, A STRUT ASSEMBLY WILL BE REQUIRED IF THE LOAD IN ONE END OF THE CAR CONSISTS OF MORE THAN FIVE (5) LOAD UNITS.

6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER MAY BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 16 THRU 36 FOR GUIDANCE.

7. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 37, 38, AND 40 FOR SHIPPING GUIDANCE.

8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 39 FOR GUIDANCE.

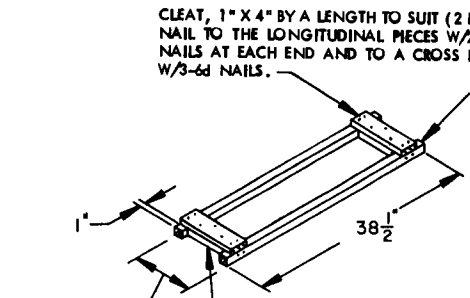
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 8"	17	12
2" X 4"	376	250
2" X 6"	82	82
2" X 8"	14	19
4" X 4"	9	12
NAILS	**NO. REQD**	**POUNDS**
6d (2")	18	NIL
10d (3")	282	4-1/2
12d (3-1/4")	157	2-3/4
16d (3-1/2")	48	1
WIRE, NO. 14 GAGE ---------- 24' REQD ---------- 1/2 LB		
1-1/4" STEEL STRAPPING ---------- 93' REQD ---------- 14 LBS		
SEALS FOR 1-1/4" STEEL STRAPPING- 6 REQD ---------- 1/4 LB		

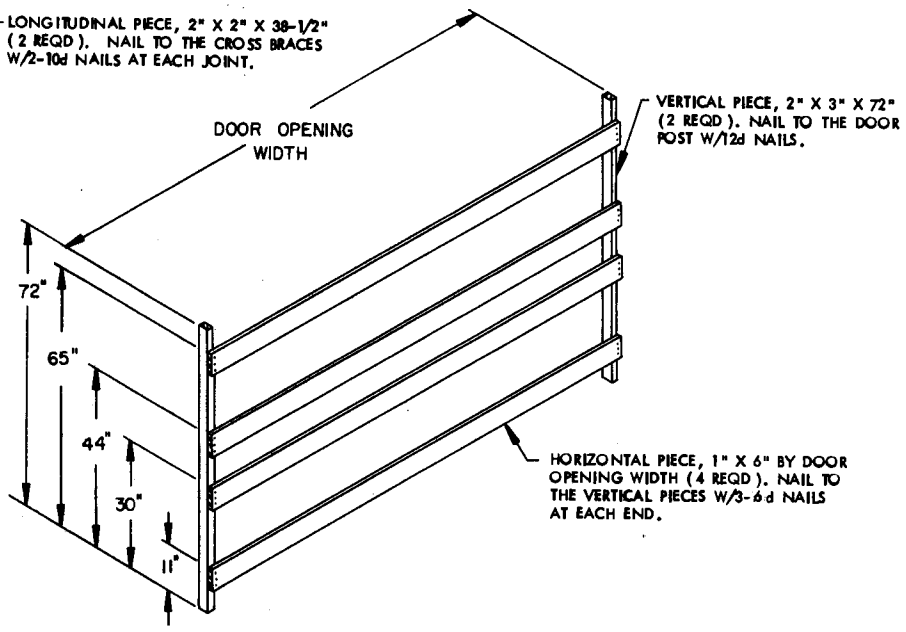
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS	48	103,056 LBS
DUNNAGE		760 LBS
TOTAL WEIGHT		103,816 LBS (APPROX)

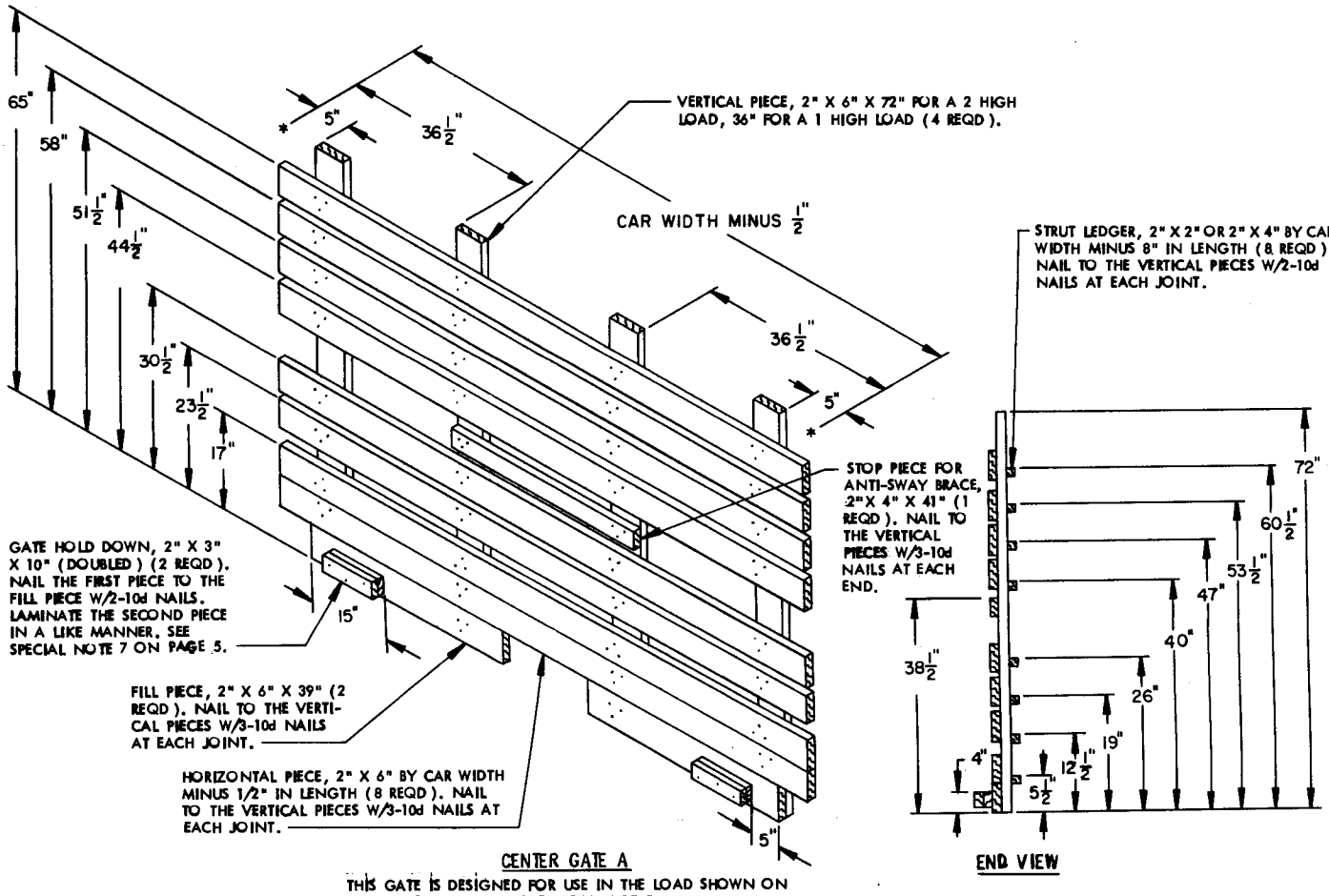
48-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS



ANTI-SWAY BRACE A



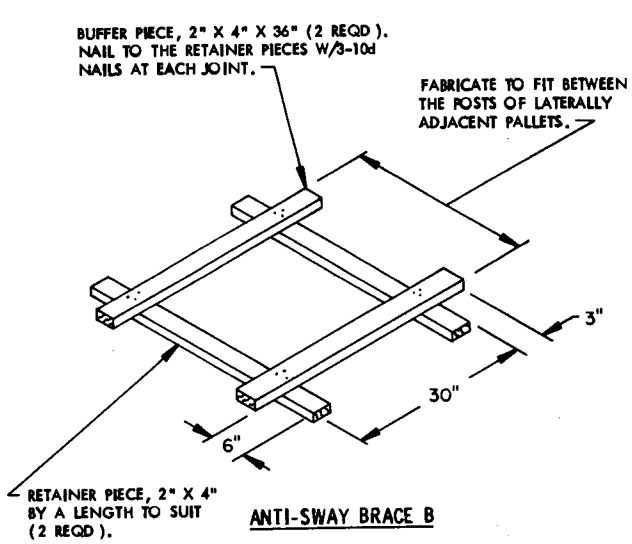
DOORWAY PROTECTION



CENTER GATE A

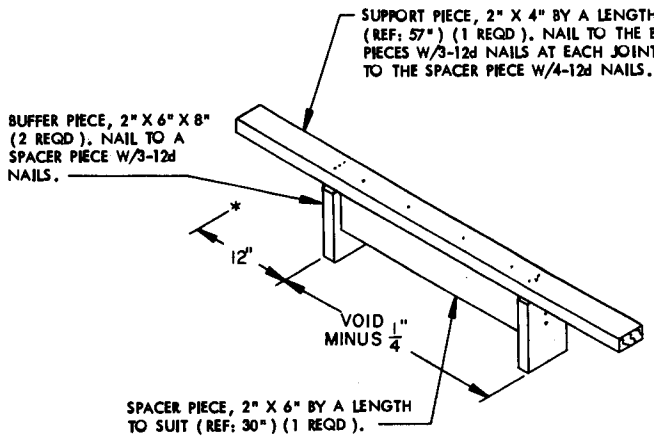
THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 4. SEE SPECIAL NOTE 9 ON PAGE 5.

END VIEW



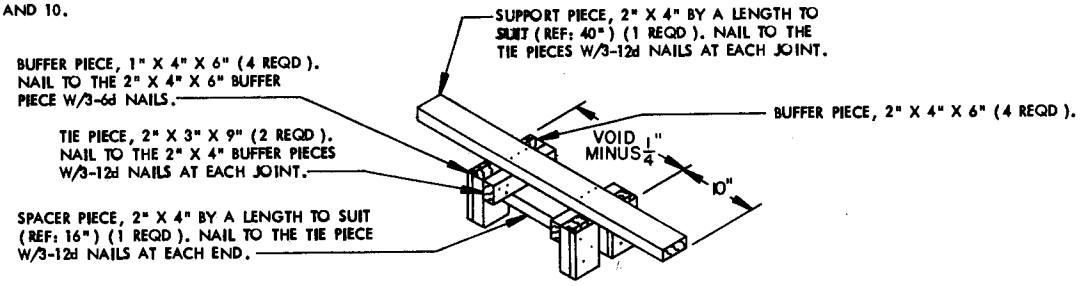
ANTI-SWAY BRACE B

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 10.



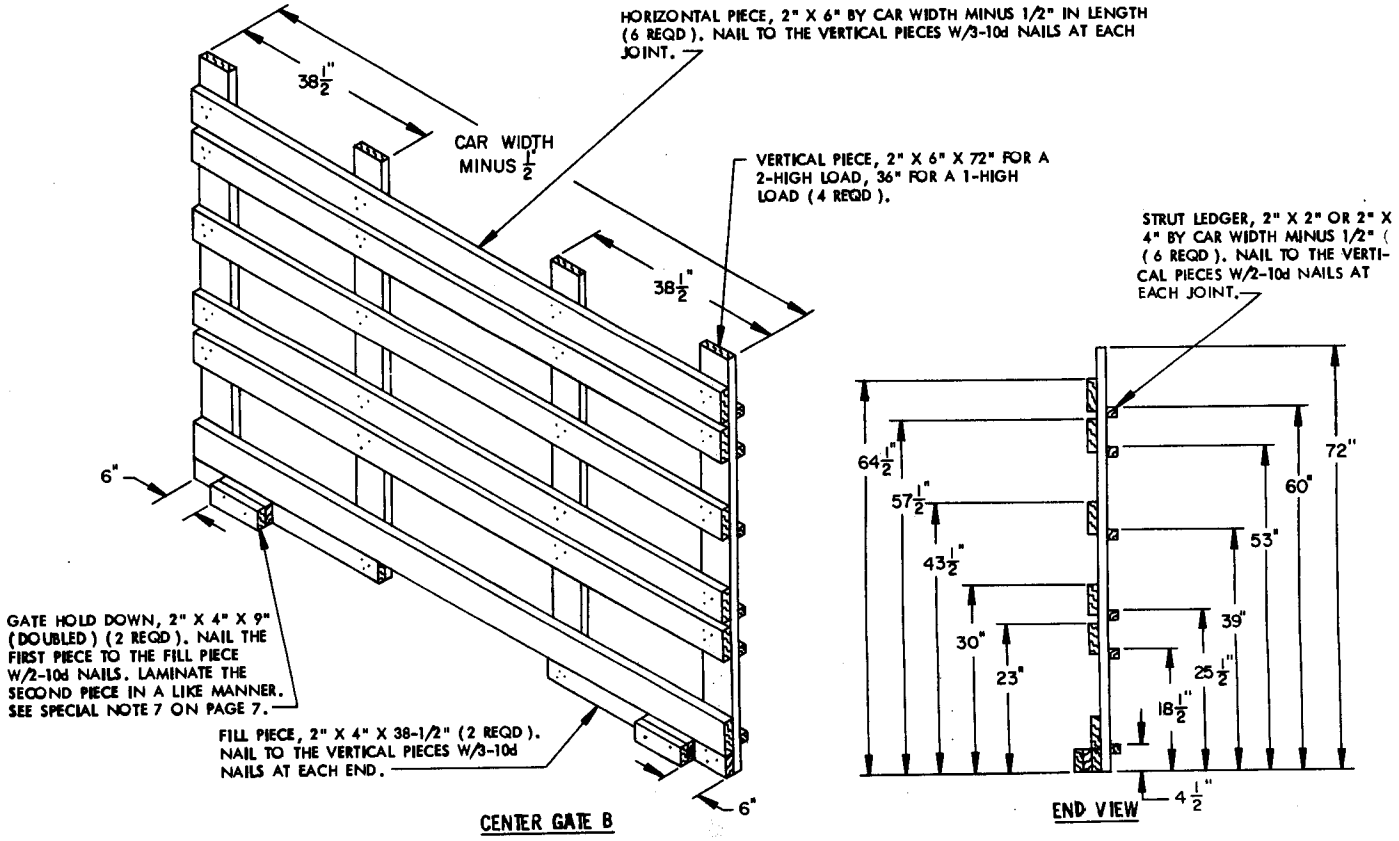
TOP-OF-LOAD ANTI-SWAY BRACE B

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 10.



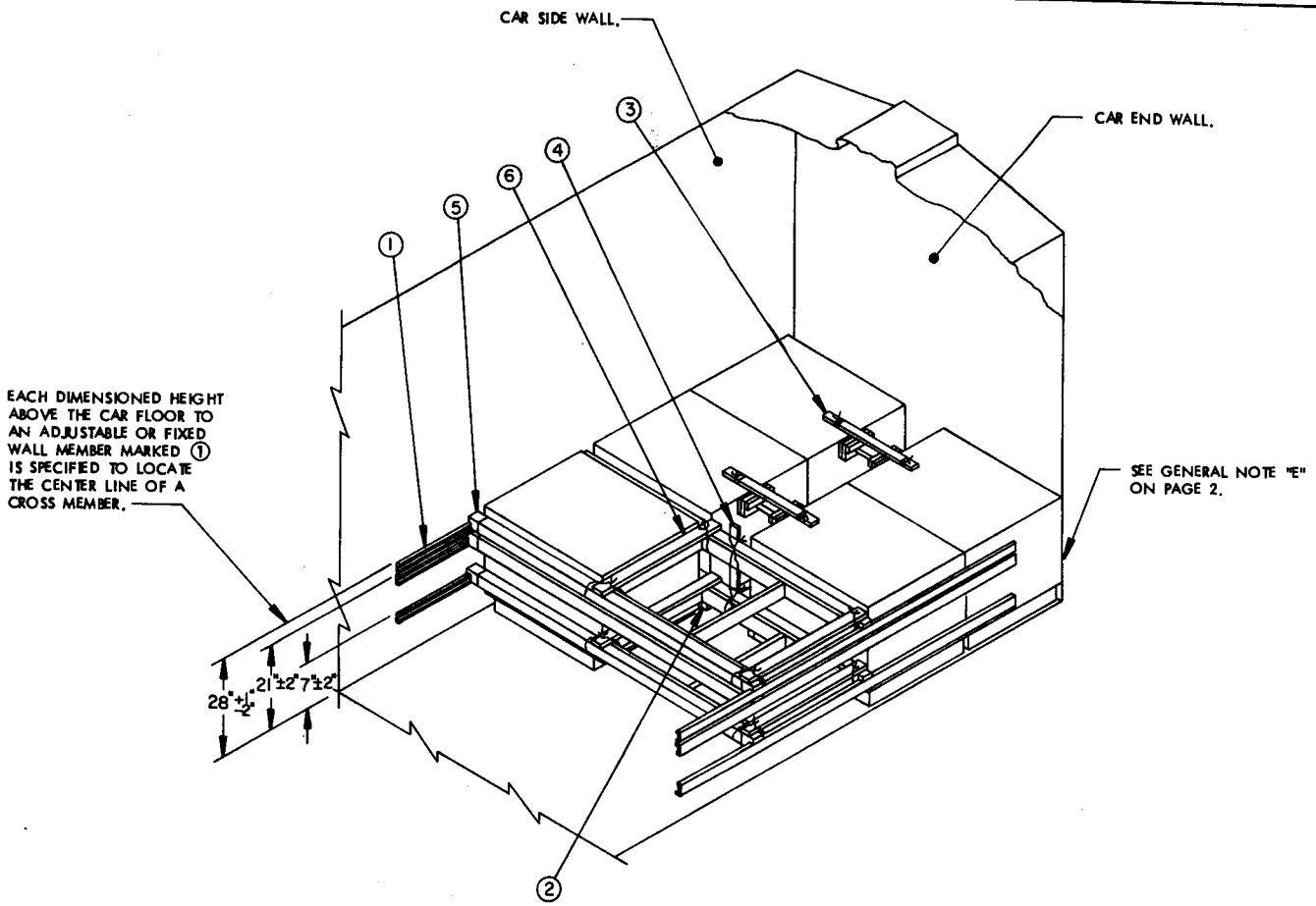
TOP-OF-LOAD ANTI-SWAY BRACE A

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 4 AND 8.



CENTER GATE B

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 6. SEE SPECIAL NOTE 8 ON PAGE 7.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (3), MUST BE INSTALLED IN END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING A 40'-6" OR A 50'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IF LOADING A 60'-8" LONG CAR.

4. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED (6), MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

KEY NUMBERS

(1) WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED (5).

(2) ANTI-SWAY BRACE (2 REQD). SEE THE ANTI-SWAY BRACE A" DETAIL ON PAGE 12. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13. WIRE TIE TO THE CENTER STRAPPING BOARD OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42. SEE SPECIAL NOTE 3.

(4) STOP PIECE, 1" X 4" X 36" (1 REQD). WIRE TIE TO THE TOP AND BOTTOM CROSS MEMBERS WITH NO. 14 GAGE WIRE TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE.

(5) CROSS MEMBER (6 REQD). SEE GENERAL NOTE "V" ON PAGE 3.

(6) SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 15 AND SPECIAL NOTE 4 AT LEFT. WIRE TIE TO THE CROSS MEMBERS WITH 2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

TYPICAL LCL (5-UNIT LOAD) IN A BOX CAR EQUIPPED WITH
MECHANICAL BRACING DEVICES HAVING ADJUSTABLE AND/OR FIXED WALL MEMBERS

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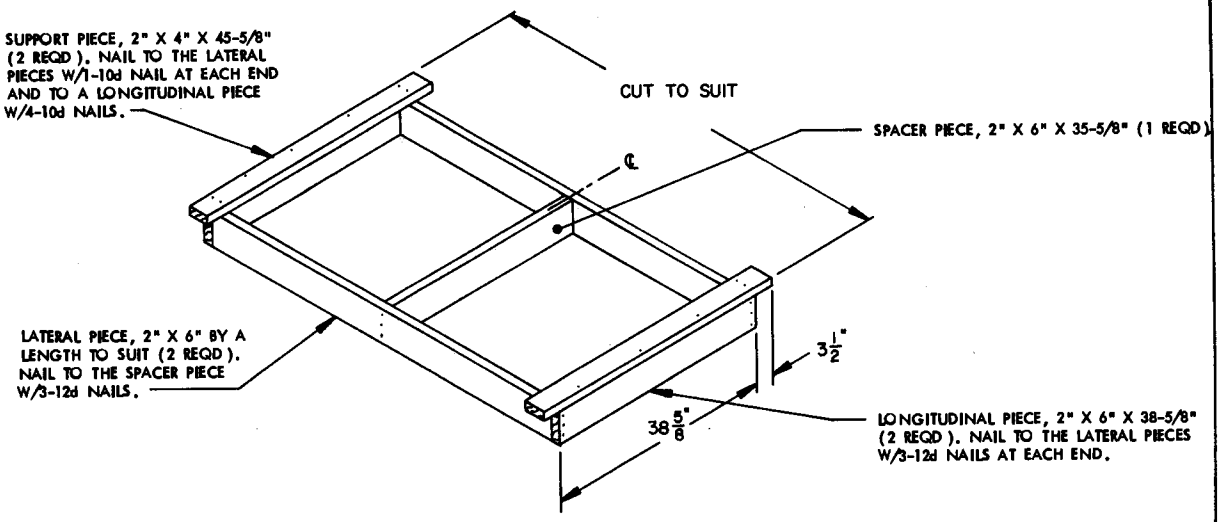
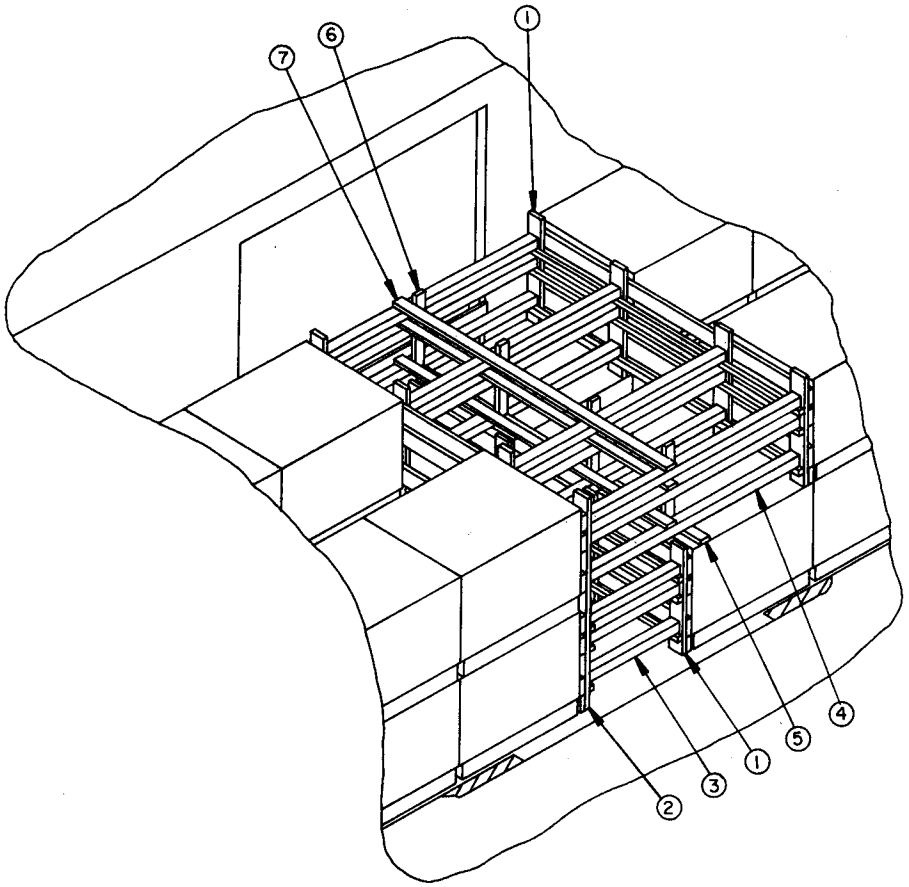


SPACER ASSEMBLY C



ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS AND LENGTHS CAN ALSO BE USED. SEE SPECIAL NOTE 3 BELOW.

2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYERS ARE SHOWN. REFER TO PAGE 6 FOR LATERAL BRACING AND DOORWAY PROTECTION REQUIREMENTS.

3. THE DEPICTED PROCEDURES ARE APPLICABLE FOR THE OMISSION OF TWO PALLET UNITS FROM A FULL LOAD IN A 50'-6" LONG CAR. THE PROCEDURES MAY ALSO BE USED FOR OMITTING TWO PALLET UNITS FROM A 60'-8" LONG CAR.

4. FOR EASE OF INSTALLATION, STRUT LEDGERS AND STRUTS, AS WELL AS THE HORIZONTAL STRUT BRACING PIECES, WILL HAVE TO BE INSTALLED AS CONSTRUCTION PROGRESSES.

KEY NUMBERS

(1) CENTER GATE FOR 1-HIGH LOAD (2 REQD). SEE THE "CENTER GATE B" DETAIL FOR 1-HIGH LOAD ON PAGE 13. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) CENTER GATE FOR 2-HIGH LOAD (1 REQD). SEE THE "CENTER GATE B DETAIL" ON PAGE 13.

(3) STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J" AND "R" ON PAGE 2 AND GENERAL NOTE "S" ON PAGE 3 AND SPECIAL NOTE 4 AT LEFT.

(4) STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.

(5) VERTICAL STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.

(6) VERTICAL STRUT BRACING, 2" X 4" X 32" (4 REQD). NAIL TO THE STRUTS, PIECES MARKED (4), W/3-10d NAILS AT EACH JOINT.

(7) HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (3 REQD). NAIL TO THE STRUTS, PIECE MARKED (4), W/3-10d NAILS AT EACH JOINT.

CONTAINERS CROSSWISE
TYPICAL LCL LOAD USING STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING

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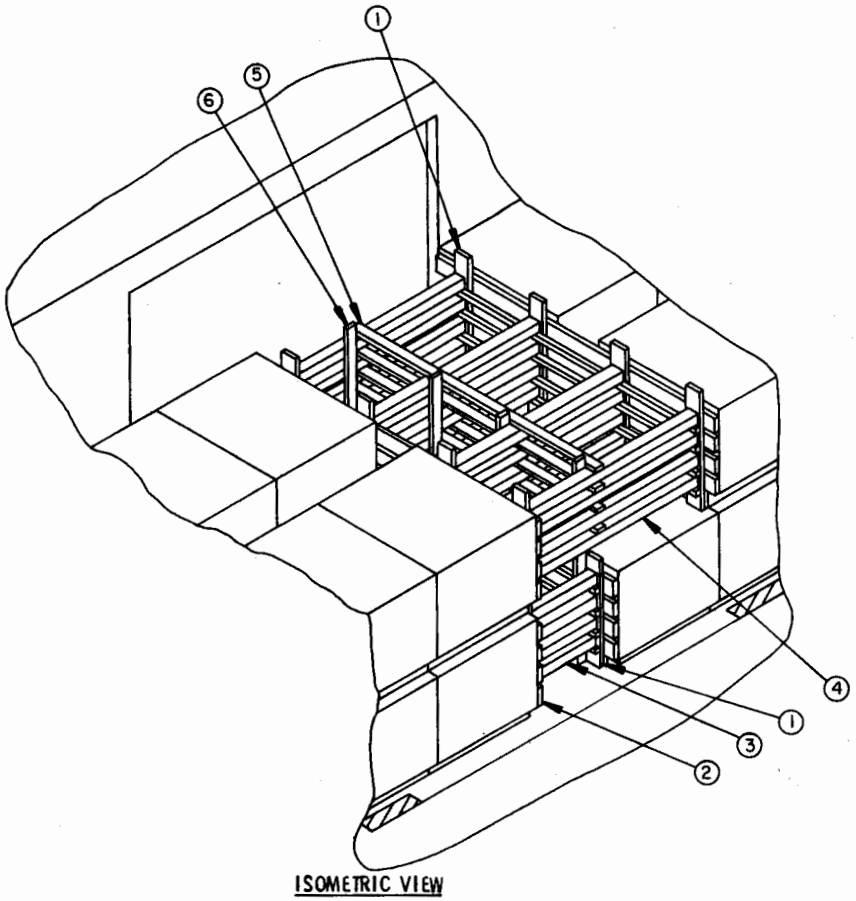


ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING. WIDER CARS AND CARS OF OTHER LENGTHS CAN ALSO BE USED. SEE SPECIAL NOTE 3.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. REFER TO PAGE 4 FOR LATERAL BRACING AND DOORWAY PROTECTION REQUIREMENTS.
3. THE DEPICTED PROCEDURES ARE APPLICABLE FOR THE OMISSION OF TWO PALLET UNITS FROM A FULL LOAD IN A 60'-8" LONG CAR. THE PROCEDURES MAY ALSO BE USED FOR OMITTING TWO PALLET UNITS FROM A FULL LOAD IN A 50'-6" CAR.
4. FOR EASE OF INSTALLATION, STRUT LEDGERS AND STRUTS, AS WELL AS THE HORIZONTAL STRUT BRACES, WILL HAVE TO BE INSTALLED AS CONSTRUCTION PROGRESSES.

KEY NUMBERS

(1) CENTER GATE FOR 1-HIGH LOAD (12 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) CENTER GATE FOR 2-HIGH LOAD (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12.

(3) STRUT, 4" X 4" BY CUT TO FIT (16 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2) IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J" AND "R" ON PAGE 2 AND GENERAL NOTE "S" ON PAGE 3. SEE SPECIAL NOTE 4 AT LEFT.

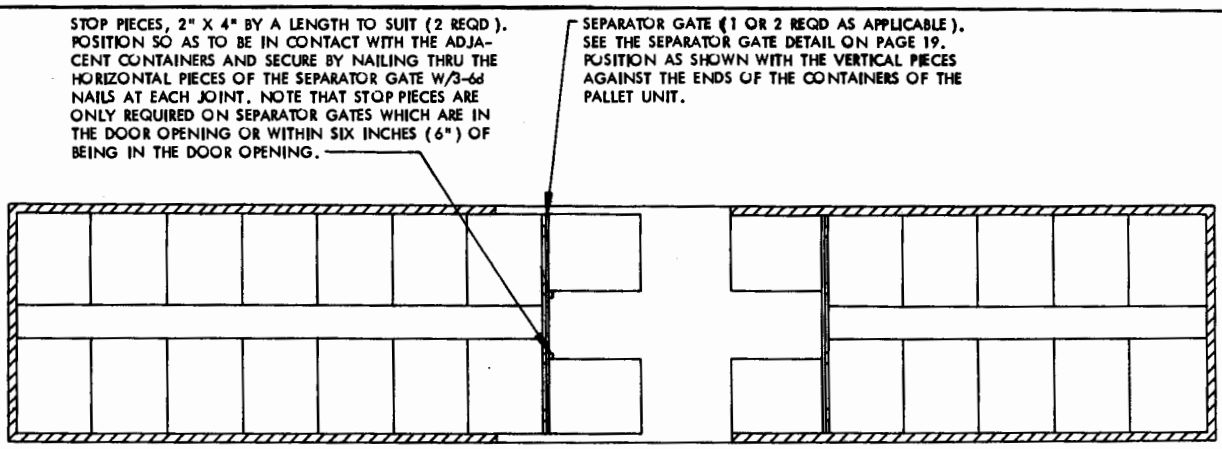
(4) STRUT, 4" X 4" BY CUT TO FIT (16 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.

(5) HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 10" IN LENGTH (4 REQD). NAIL TO THE STRUTS, PIECE MARKED (4), W/3-10d NAILS AT EACH JOINT.

(6) VERTICAL STRUT BRACING, 2" X 4" X 67" (4 REQD). NAIL TO THE STRUTS, PIECE MARKED (4), W/3-10d NAILS AT EACH JOINT.

CONTAINERS LENGTHWISE

TYPICAL LCL LOAD USING STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING



TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

A TWELVE LONG PLUS TWO WIDE LOAD IS SHOWN.

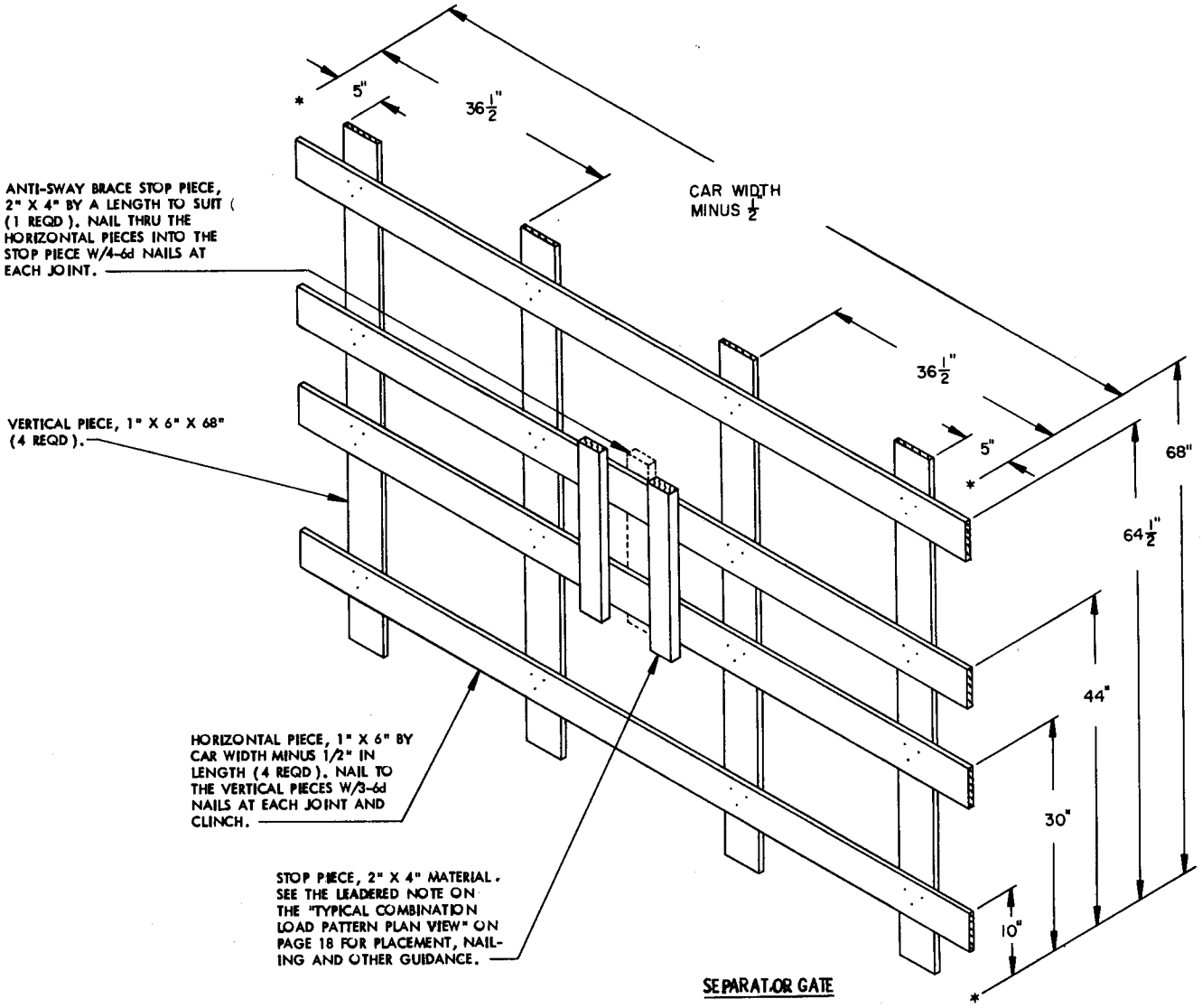
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE ARE PRESENTED TO PROVIDE AN ALTERNATIVE METHOD OF OBTAINING A LOAD QUANTITY OTHER THAN THAT SHOWN IN ANY OF THE LOADS DEPICTED HEREIN OR AS COVERED BY THE SPECIAL NOTES FOR A LOAD.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN THE SEPARATOR GATES, HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE ENDS OF THE CONTAINERS ON THE ADJACENT PALLET UNIT.
4. A CHART IS SHOWN WHICH PROVIDES DATA FOR 40'-6", 50'-6" AND 60'-8" LONG CARS. LOADING PATTERNS FOR A SPECIFIC QUANTITY (PER LAYER) WHICH CAN BE ATTAINED BY THE COMBINATION LOAD METHOD, AND THE PATTERNS REQUIRED TO PROVIDE THESE QUANTITIES ARE SPECIFIED. FOR COMPARISON PURPOSES, THE OTHER TYPE LOADS WHICH CAN BE USED TO OBTAIN A LOAD QUANTITY WHICH IS EITHER THE SAME OR TWO PALLET UNITS PER LAYER MORE OR LESS THAN THE QUANTITY OBTAINABLE BY A COMBINATION LOAD ARE GIVEN, AS WELL AS THE APPROXIMATE STRUT LENGTHS FOR EACH OF THE LOADS.
5. STOP PIECES ARE ONLY REQUIRED ON SEPARATOR GATES WHICH ARE IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING. POSITION SO AS TO BE IN CONTACT WITH THE ADJACENT CONTAINERS AND SECURE BY NAILING THRU THE HORIZONTAL PIECES OF THE SEPARATOR GATE W/3-6d NAILS AT EACH JOINT.

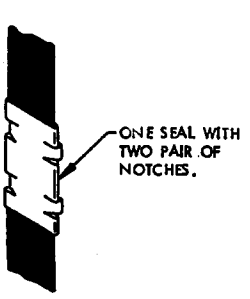
LOAD CHART

CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6"	22	LOAD ON PAGE 4	55"
	22	9 AT 38.625" PLUS 2 AT 47"	35"
	22	8 AT 38.625" PLUS 3 AT 47"	27"
	20	4 AT 38.625" PLUS 6 AT 47"	40"
	20	3 AT 38.625" PLUS 7 AT 47"	32"
	18	LOAD ON PAGE 6	57"
50'-6"	30	LOAD ON PAGE 4	20"
	28	10 AT 38.625" PLUS 4 AT 47"	22"
	26	11 AT 38.625" PLUS 3 AT 47"	31"
	26	5 AT 38.625" PLUS 8 AT 47"	27"
	24	LOAD ON PAGE 6	36"
60'-8"	36	LOAD ON PAGE 4	26"
	34	13 AT 38.625" PLUS 4 AT 47"	28"
	32	8 AT 38.625" PLUS 8 AT 47"	34"
	30	3 AT 38.625" PLUS 12 AT 47"	39"
	30	2 AT 38.625" PLUS 13 AT 47"	30"
	28	LOAD ON PAGE 6	64"

TYPICAL COMBINATION LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

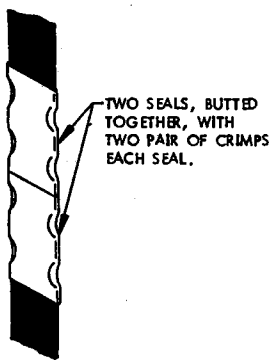


SEPARATOR GATE



STRAP JOINT A

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



STRAP JOINT B

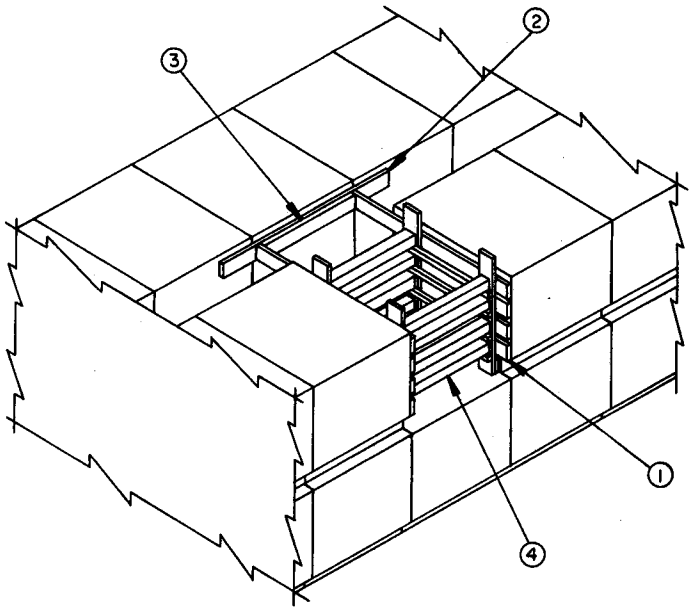
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

TYPICAL COMBINATION LOAD IN A 50'-6" LONG CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

4. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECE IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS WILL HAVE TO BE ADJUSTED ACCORDING TO THE CAR BEING LOADED.

5. FOR EASE OF INSTALLATION, STRUT LEDGERS AND STRUTS WILL HAVE TO BE INSTALLED AS CONSTRUCTION PROGRESSES.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.

2. A UNIT OMITTED FROM THE TOP LAYER OF A TWO-LAYER LOAD IS SHOWN AS TYPICAL. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED-UNIT AND A CENTER GATE.

3. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 4 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

(CONTINUED ABOVE)

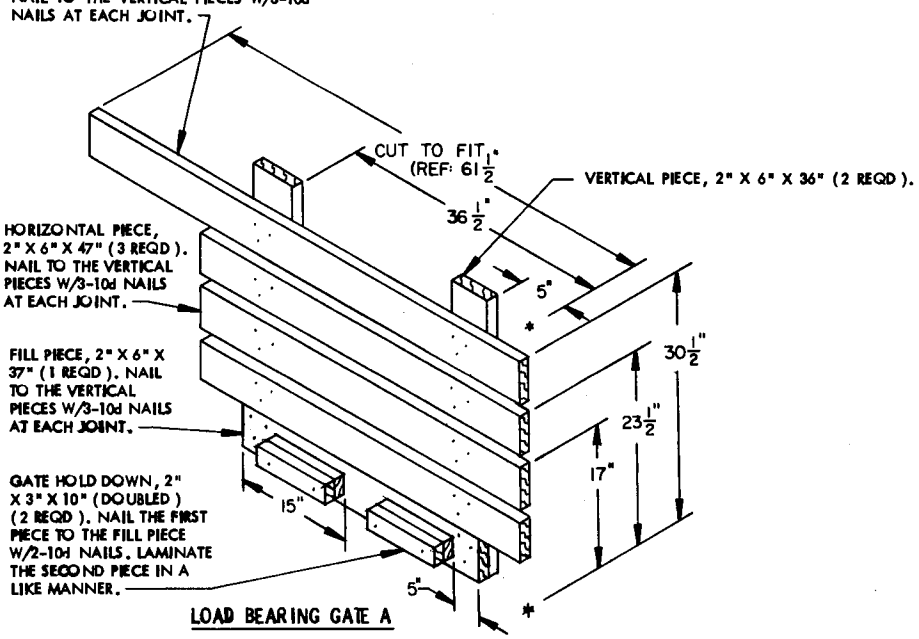
KEY NUMBERS

① LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE A" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED ③, W/3-10d NAILS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

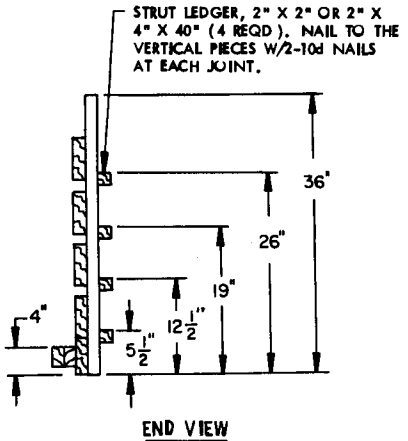
② ANTI-SWAY BEARING PIECE, 2" X 6" X 60" (1 REQD).

③ FILLER PIECE, 2" X 6" X 35-5/8" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ②, W/5-10d NAILS.

④ STRUT, 4" X 4" X 32-5/8" (8 REQD). TOENAIL TO PIECES MARKED ① W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 ABOVE.



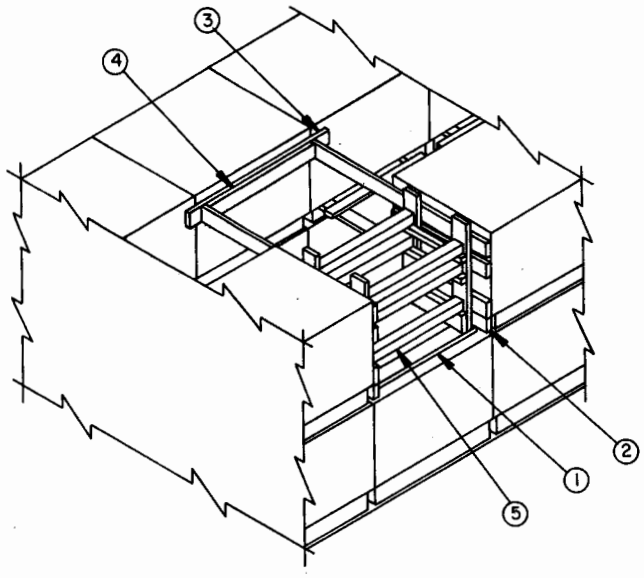
LOAD BEARING GATE A



END VIEW

CONTAINERS LENGTHWISE

TYPICAL LCL-ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A LOAD



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. A UNIT OMITTED FROM THE TOP LAYER OF A TWO-LAYER LOAD IS SHOWN AS TYPICAL. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
3. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 6 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
4. THE REFERENCE DIMENSION GIVEN FOR THE CUT TO FIT PIECE IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS WILL HAVE TO BE ADJUSTED ACCORDING TO THE CAR BEING LOADED.

KEY NUMBERS

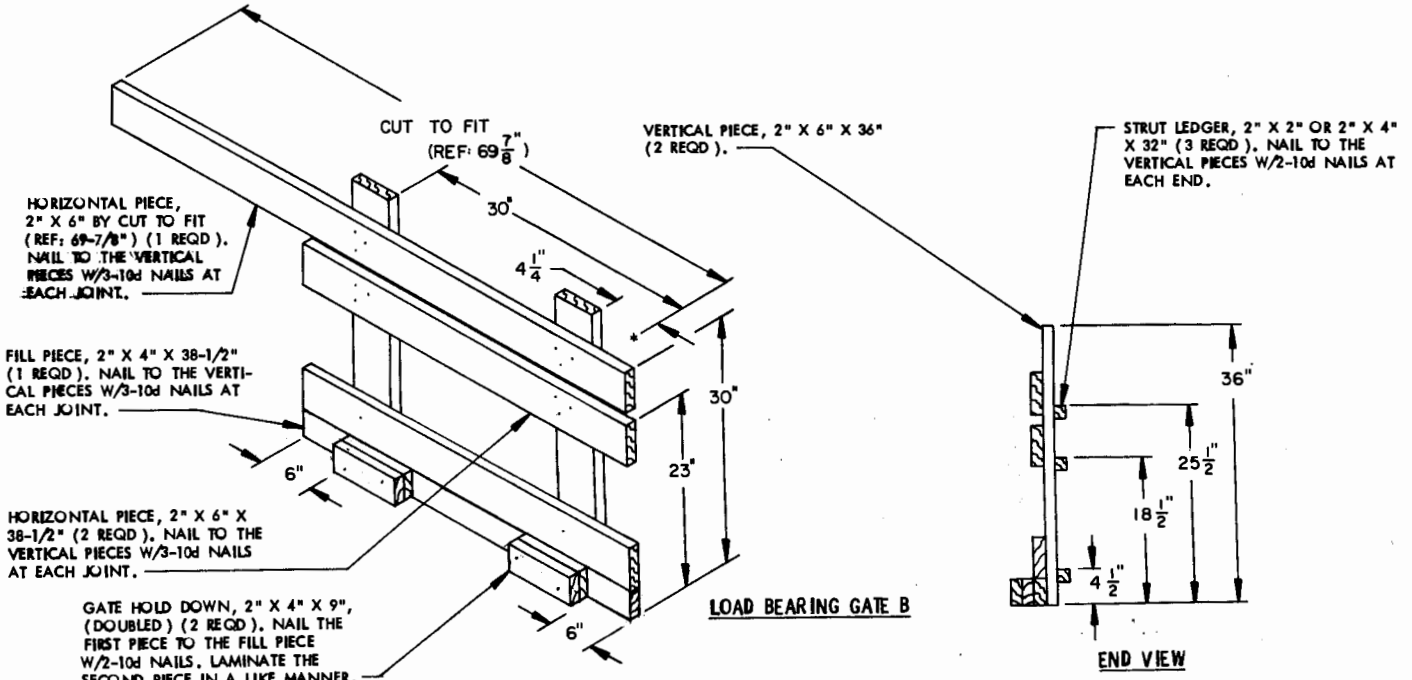
(1) SUPPORT PIECE, 2" X 6" X 47" (2 REQD). SLIDE UNDERNEATH THE TIEDOWN STRAPS SO AS TO BE ADJACENT TO THE OUTER STRAPPING BOARDS AND STAPLE EACH STRAP TO THE SUPPORT PIECE.

(2) LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE B" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED (4), W/3-10d NAILS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(3) ANTI-SWAY BEARING PIECE, 2" X 6" X 60" (1 REQD).

(4) FILLER PIECE, 2" X 6" X 44" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED (3), W/5-10d NAILS.

(5) STRUT, 4" X 4" X 41" (6 REQD). TOENAIL TO PIECES MARKED (2) W/2-16d NAILS AT EACH END.

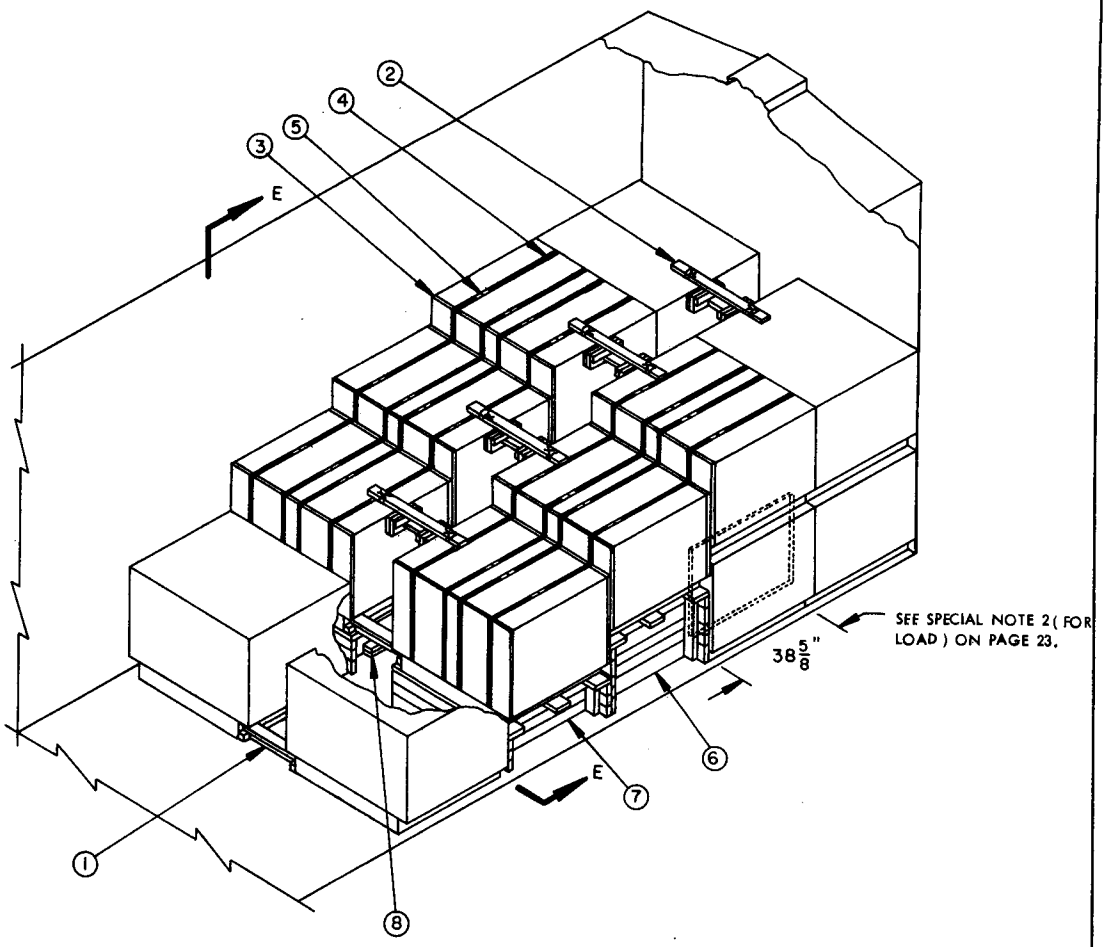


LOAD BEARING GATE B

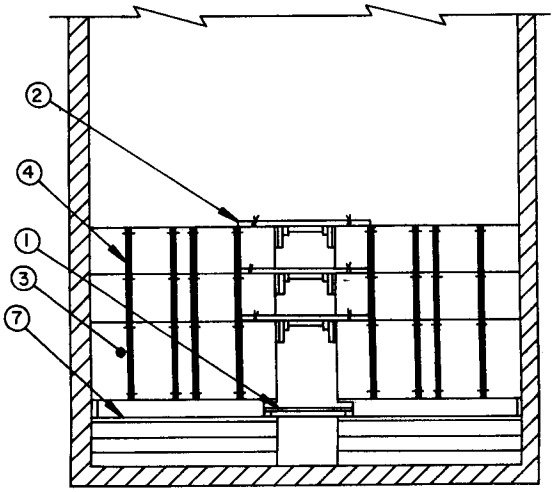
END VIEW

CONTAINERS CROSSWISE

TYPICAL LCL-ONE PALLET UNIT OMITTED FROM TOP LAYER OF A LOAD



ISOMETRIC VIEW



SECTION E-E

KEY NUMBERS

(1) ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 12. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 23.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13. WIRE TIE TO THE UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42.

(3) STRAPPING PANEL, 1/2" PLYWOOD 24" X 47" (16 REQD/2 PER PALLET UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 24. SEE SPECIAL NOTE 5 ON PAGE 23.

(4) REINFORCING STRAP, 1-1/4" X .035" X 13'-6" LONG (REF) STEEL STRAPPING (32 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING PANELS. SECURE TO A STRAPPING PANEL W/2 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 24.

(5) SEAL FOR 1-1/4" STRAPPING (64 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.

(6) RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 23.

(7) RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE ONE-THIRD OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 23.

(8) STOP PIECE FOR RISER ASSEMBLY, 2" X 4" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 6 ON PAGE 23.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING

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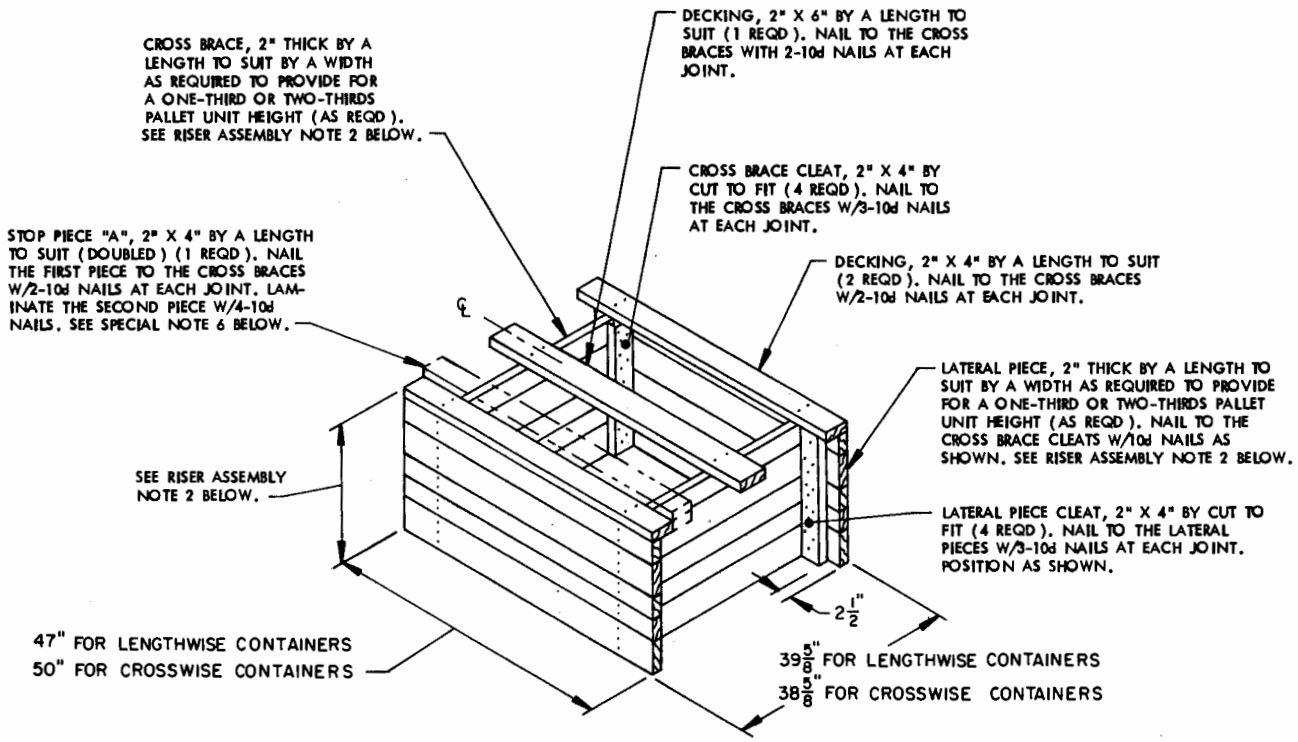


RISER ASSEMBLY

SPECIAL NOTES FOR LOAD:

1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR. THE PROCEDURES ARE ALSO APPLICABLE FOR UNITS WITH CROSSWISE POSITIONED CONTAINERS. SEE SPECIAL NOTES 4 THRU 6.
3. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
4. ANTI-SWAY BRACE "A" IS APPLICABLE FOR LENGTHWISE POSITIONED CONTAINERS. ANTI-SWAY BRACE "B" WILL BE USED FOR LOADS OF CROSSWISE POSITIONED CONTAINERS.
5. FOR CROSSWISE POSITIONED CONTAINERS LOADS THE STRAPPING PANELS, PIECE MARKED (3), WILL NOT BE REQUIRED. SEE THE "METHOD B" DETAIL ON PAGE 24 FOR MODIFICATIONS TO BE ACCOMPLISHED IN LIEU OF USING STRAPPING PANELS.
6. STOP PIECES, PIECE MARKED (8), ARE REQUIRED TO RETAIN THE RISER ASSEMBLIES WHEN SHIPPING LOADS OF LENGTHWISE POSITIONED CONTAINERS. FOR LOADS OF CROSSWISE POSITIONED CONTAINERS THE STOP PIECES WILL BE APPLIED TO THE RISER ASSEMBLIES. SEE THE PHANTOM LINED PIECES ON THE RISER ASSEMBLY DETAIL ABOVE FOR GUIDANCE. POSITION SO AS TO BE AGAINST THE INNER EDGE OF THE BOTTOM DECK BOARD OF THE PALLET WHICH IS ADJACENT TO THE CAR SIDEWALL.

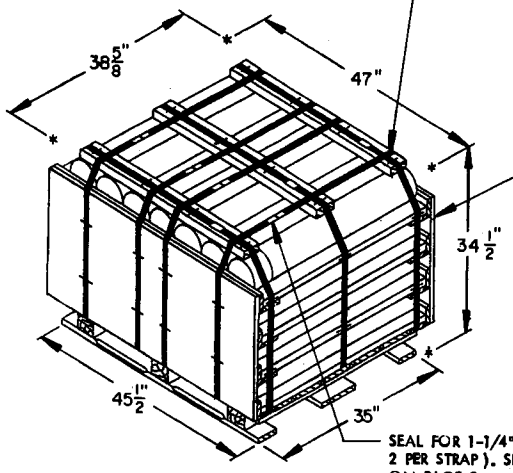
SPECIAL NOTES FOR RISER ASSEMBLY:

1. A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE, AND AS KEY NUMBER (6) IN THE LOAD ON PAGE 22. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM TWO (2) PIECES OF 2" X 6" MATERIAL AND THREE (3) PIECES OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 23" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER (7) IN THE LOAD ON PAGE 22, WILL BE FABRICATED FROM THREE (3) PIECES OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 1/2" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL PIECES AND CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. NOTE: A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT.

REINFORCING STRAP, 1-1/4" X .035" X 13'-0" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING PANELS. SECURE TO THE STRAPPING PANELS W/2 STAPLES EACH. NOTE THAT THESE STRAPS WILL BE INSTALLED RIGHT OVER THE TIEDOWN STRAPS.

NOTE:

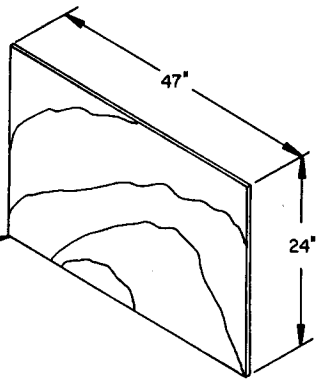
THE "METHOD A" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR THE UNITS WHICH ARE TO BE POSITIONED WITH THE CONTAINERS LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 22. FOR MODIFICATION OF UNITS TO BE POSITIONED WITH THE CONTAINERS CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL BELOW.



STRAPPING PANEL (2 REQD). SEE THE DETAIL BELOW.

SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). SEE GENERAL NOTE "M" ON PAGE 2.

METHOD A



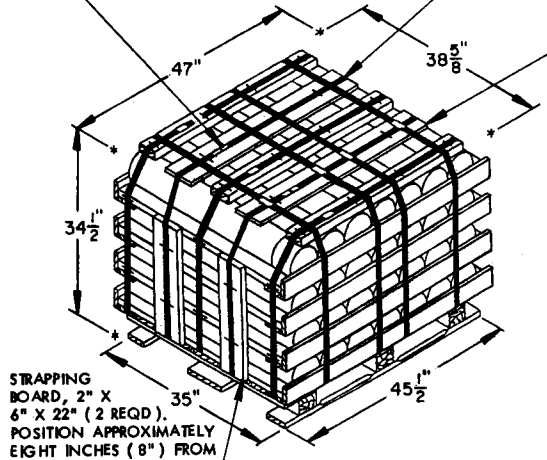
1/2" PLYWOOD, 24" X 47" (1 REQD).

STRAPPING PANEL

REINFORCING STRAP, 1-1/4" X .035" X 15'-7" LONG STEEL STRAPPING (4 REQD). INSTALL UNDER THE TIEDOWN STRAPS SO AS TO ENCIRCLE THE PALLET UNIT AND THE 1" X 6" AND 2" X 6" STRAPPING BOARDS, SECURE TO EACH STRAPPING BOARD W/2 STAPLES.

SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). SEE GENERAL NOTE "M" ON PAGE 2.

STRAPPING BOARD, 1" X 6" X 37" (2 REQD). POSITION UNDER THE TIEDOWN STRAPS AND SO AS TO ALIGN WITH THE SIDE STRAPPING BOARDS.



STRAPPING BOARD, 2" X 6" X 22" (2 REQD). POSITION APPROXIMATELY EIGHT INCHES (8") FROM THE END OF THE UNIT.

METHOD B

NOTE:

THE "METHOD B" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WHICH ARE TO BE POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 22. FOR MODIFICATION OF UNITS TO BE POSITIONED WITH THE CONTAINERS LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL ABOVE.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING

PROJECT CA 225/4-85

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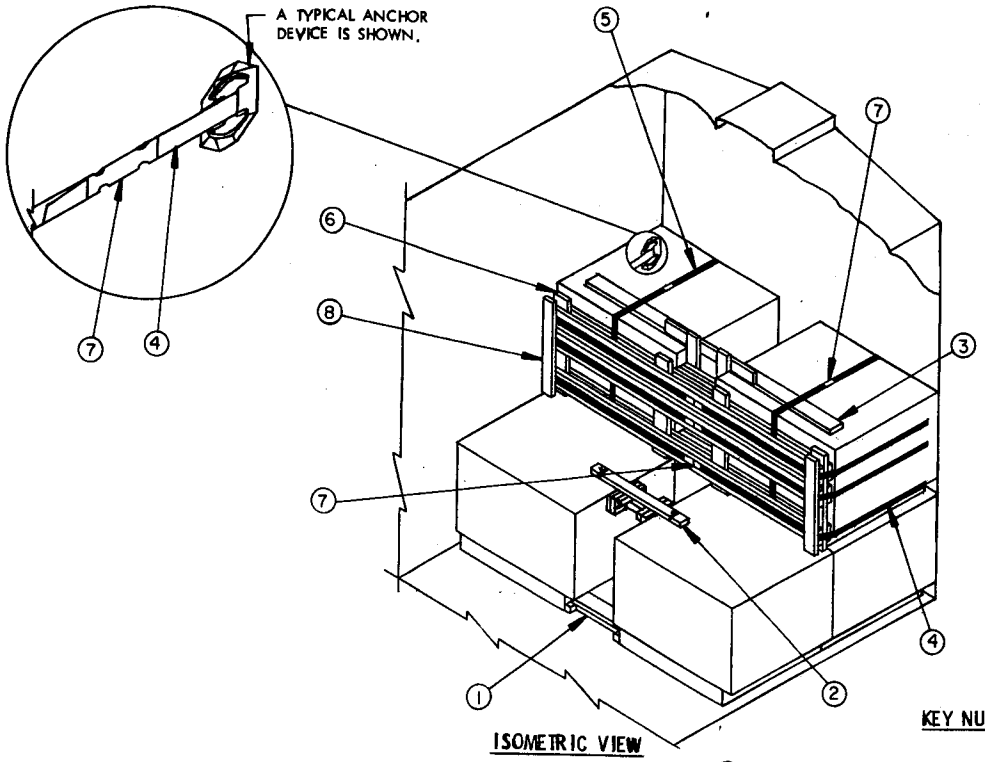


ISOMETRIC VIEW

KEY NUMBERS

(1) ANTI-SWAY BRACE (3 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 12. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42.

(3) BEARING PIECE FOR BULKHEAD GATE SUPPORT PIECE, 2" X 6" X 39" (2 REQD). SLIDE UNDER THE TIEDOWN STRAPS OF THE UNIT SO AS TO BE ADJACENT TO THE OUTER STRAPPING BOARD OF THE UNIT. SECURE BY STAPLING EACH TIE-DOWN STRAP TO THE BEARING PIECE.

(4) BULKHEAD STRAP, 1-1/4" X .031" OR .035" X 23'-0" LONG (REF) STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 27 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.

(5) BUNDLING STRAP, 1-1/4" X .035" X 14'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT AND THE HORIZONTAL PIECES OF THE BULKHEAD GATE, PIECE MARKED (6). TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED (4).

(6) BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 27. SEE SPECIAL NOTE 3 AT LEFT.

(7) SEAL FOR 1-1/4" STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED (4), AND 1 PER BUNDLING STRAP, PIECE MARKED (5)). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "M" ON PAGE 2.

(8) STRAP RETAINER, 2" X 4" X 30" (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

SPECIAL NOTES:

1. A 9'-4" WIDE ALL-METAL BOX CAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.

2. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED CONTAINERS PALLET UNITS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED CONTAINERS PALLET UNITS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.

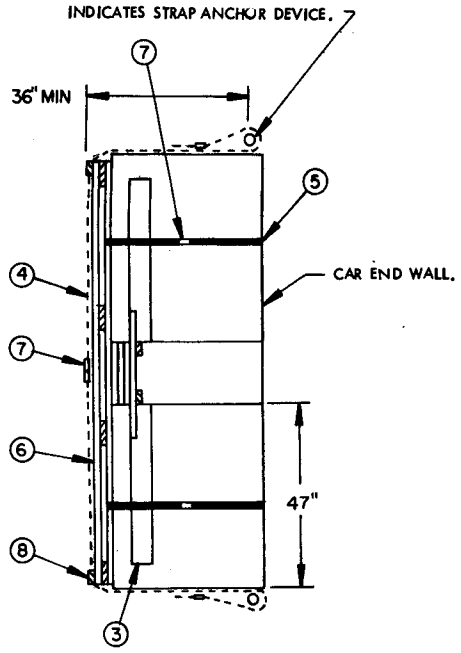
3. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,500 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 5,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS. A BULKHEAD GATE WITH 2 STRAPS WILL RETAIN 1 PALLET UNIT; A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN 2 UNITS.

4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 17 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 20 FOR A SINGLE UNIT.

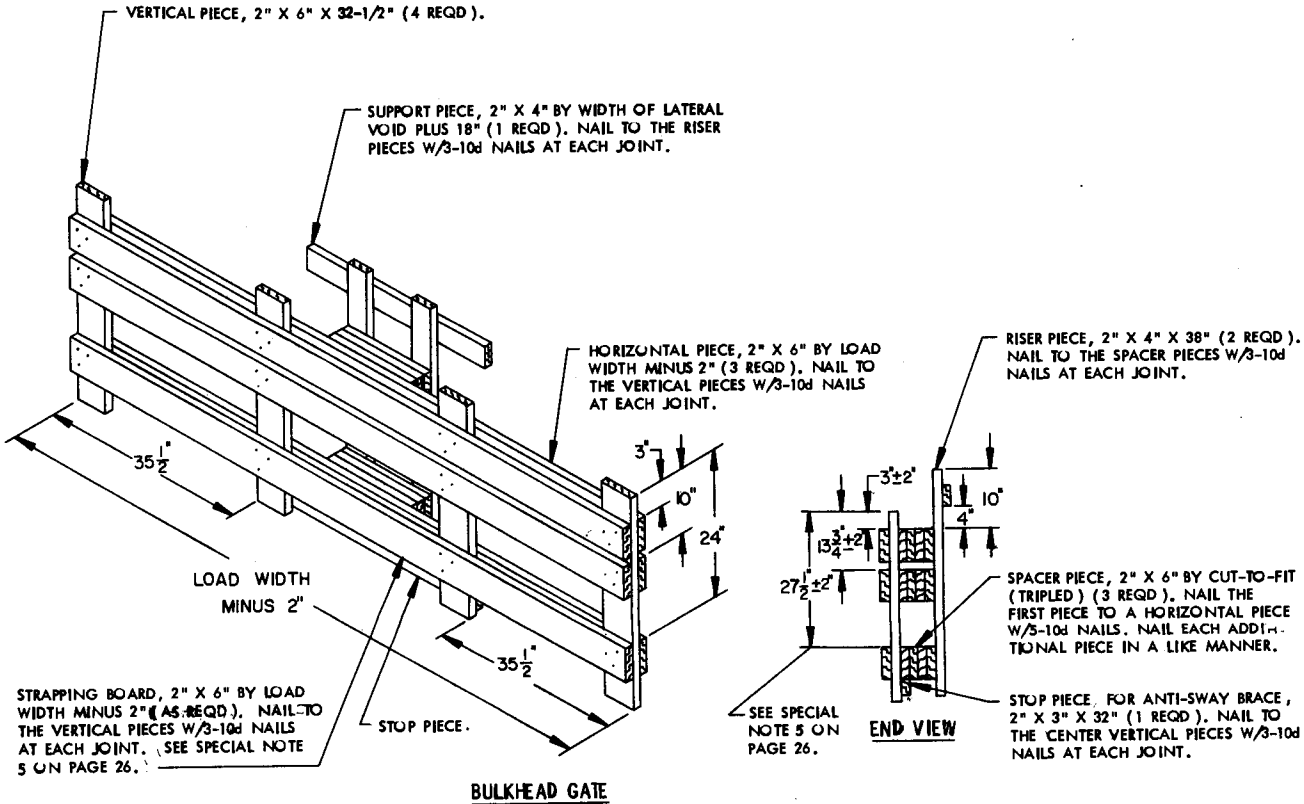
5. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE ON PAGE 27 FOR THE LOCATION OF THE STRAPPING BOARDS IN RELATION TO THE LOCATION OF THE HORIZONTAL PIECES. THE STRAPPING BOARDS SHOULD BE LOCATED WITHIN THESE TOLERANCES. IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.

CONTAINERS LENGTHWISE

TYPICAL UCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING



STRAP APPLICATION PLAN VIEW



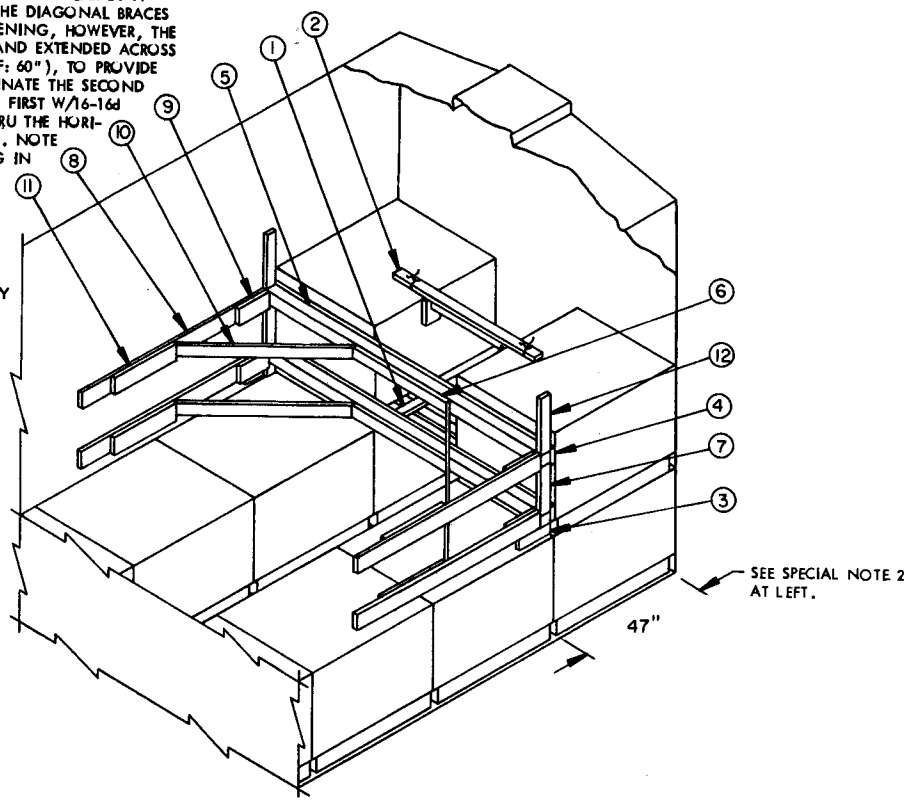
BULKHEAD GATE

CONTAINERS LENGTHWISE
TYPICAL LCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING

(SPECIAL NOTES CONTINUED)

⑨, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.

6. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.

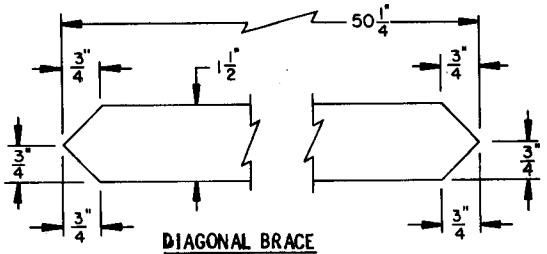
2. THE PALLET UNITS SHOWN IN THE TYPICAL LCL LOADS ARE POSITIONED WITH THE CONTAINERS ON THE UNIT CROSSWISE IN THE CAR. K-BRACES MAY ALSO BE USED IN LOADS OF LENGTHWISE POSITIONED CONTAINERS. ANTI-SWAY BRACE "A" AND TOP-OF-LOAD ANTI-SWAY BRACE "A" WILL THEN BE USED IN LIEU OF THE SPECIFIED ANTI-SWAY BRACE "B" AND TOP-OF-LOAD ANTI-SWAY BRACE "B".

3. PARTIAL-LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. A CROSSWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR LENGTHWISE LOADS. NOTE THAT FOR A LENGTHWISE PARTIAL TIER, THE PIECES MARKED ④ AND ⑤ SHOULD BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNITS IN THE SAME LOCATION AS THE UPPER AND LOWER HORIZONTAL PIECES OF A CENTER GATE.

4. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER, BE IT A SECOND TIER OR FIRST. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 29, 30, AND 31 FOR SELECTION OF THE APPLICABLY SIZED K- BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

5. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③, ④, ⑤, ⑦,

(CONTINUED ABOVE)



DIAGONAL BRACE

KEY NUMBERS

① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 13. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "K" AND "L" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.

② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 13. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 42. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.

③ SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION SO TOP EDGE IS 4-1/2" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 5 AT LEFT.

④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.

⑤ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).

⑥ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/7-16d NAILS. SEE SPECIAL NOTE 6 ABOVE.

⑦ SPACER CLEAT, 2" X 4" X 17-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑧ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

⑨ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/4-16d NAILS.

⑩ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/2-16d NAILS AT EACH END.

⑪ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/8-16d NAILS.

⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

TYPICAL LCL LOAD USING K-BRACE METHOD OF PARTIAL-LAYER BRACING

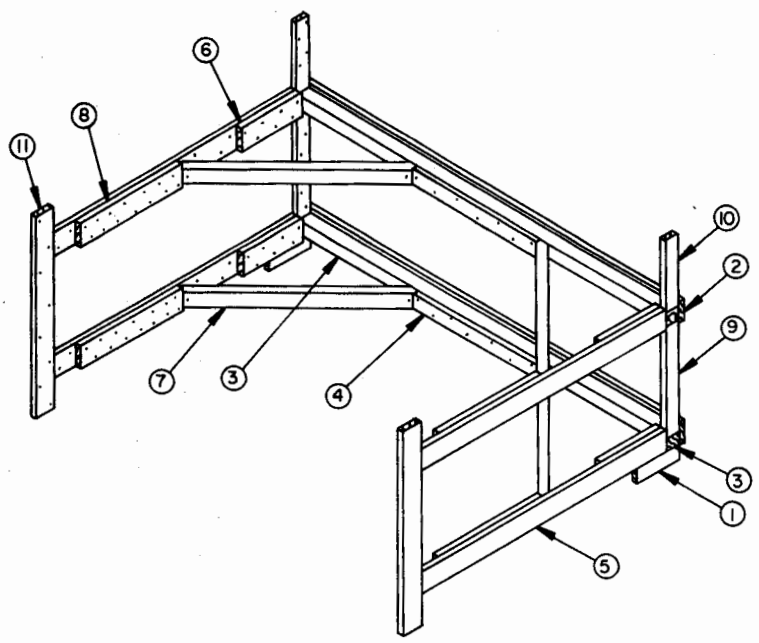
SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN SIX (6) UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 30 AND 31 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 MAY BE USED.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

4. REFER TO PAGE 28 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION SO TOP EDGE IS 4-1/2" ABOVE LOWER PALLET. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).

④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.

⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.

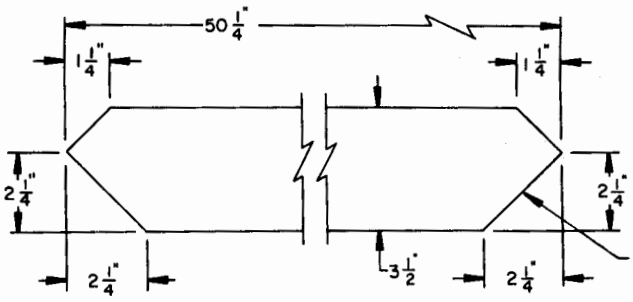
⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.

⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.

⑨ SPACER CLEAT, 2" X 4" X 17-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

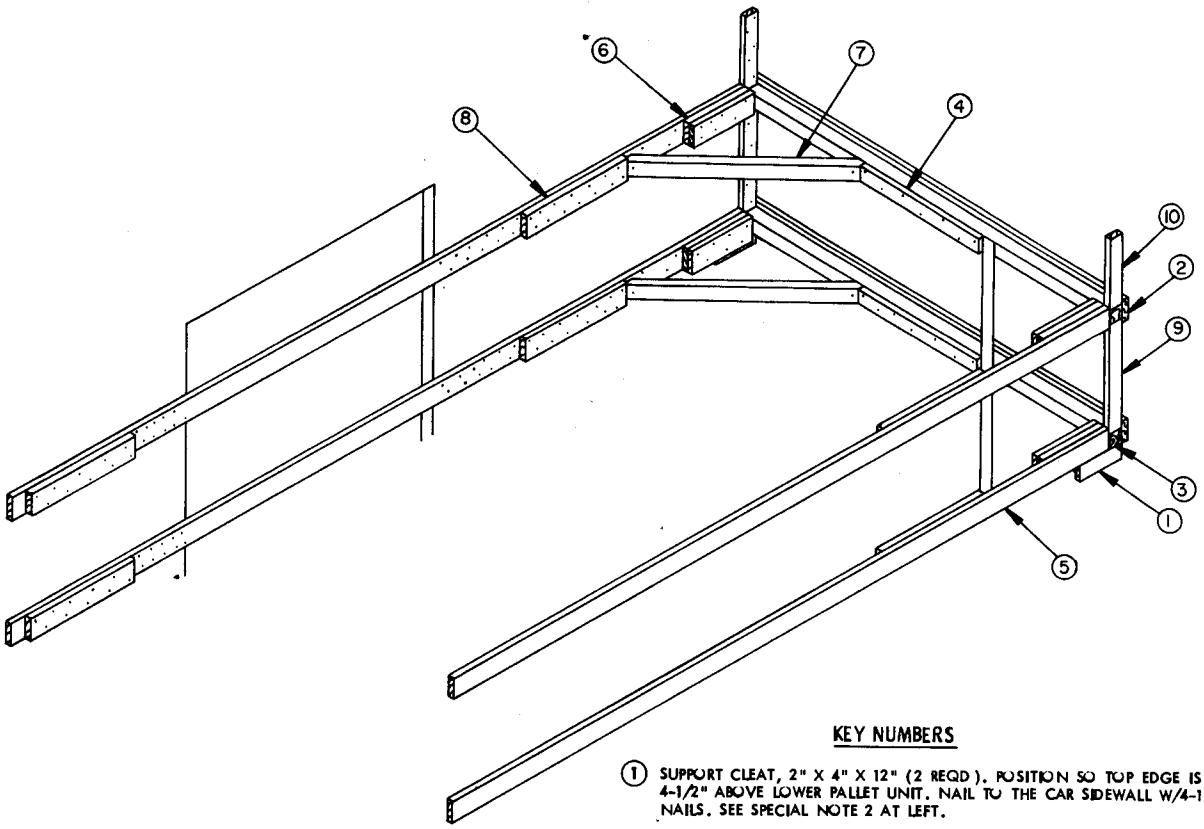
⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



DIAGONAL BRACE

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.



ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN EIGHT (8) UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 31 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 8,000 POUNDS AND 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OF LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED (1), (2), (3), (6), (9), AND (10) MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED (7) TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED (5) MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED (5) IS DOUBLED.

(CONTINUED AT RIGHT)

KEY NUMBERS

(1) SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION SO TOP EDGE IS 4-1/2" ABOVE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.

(2) LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED (3), W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(3) CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).

(4) CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED (3), W/7-16d NAILS. SEE SPECIAL NOTE 3 BELOW.

(5) HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED (3) OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

(6) POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONATL WALL CLEAT, PIECE MARKED (5), W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.

(7) DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED (3), AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (5), W/1-60d NAIL AT EACH END.

(8) BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (5), W/14-16d NAILS.

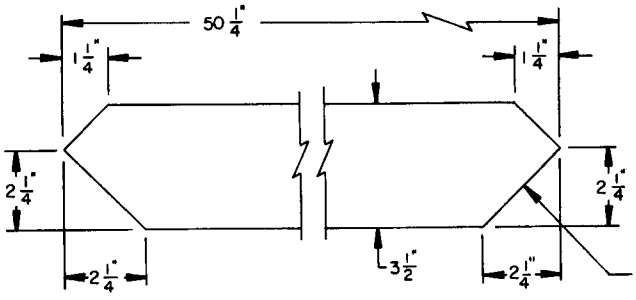
(9) SPACER CLEAT, 2" X 4" X 17-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

(10) HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

(SPECIAL NOTES CONTINUED)

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED (4), WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2" AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

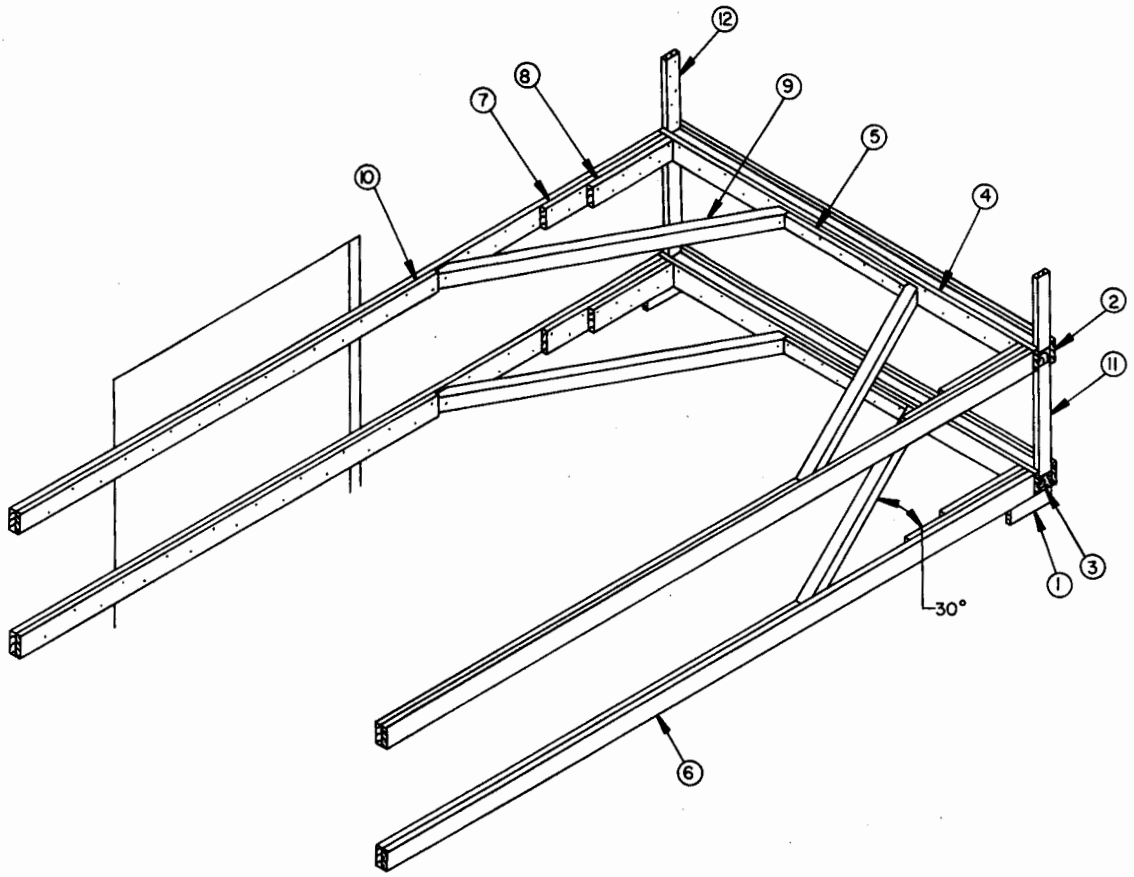
4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED (5), THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED (3), OR A HORIZONTAL WALL CLEAT, PIECE MARKED (5).

DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.



ISOMETRIC VIEW

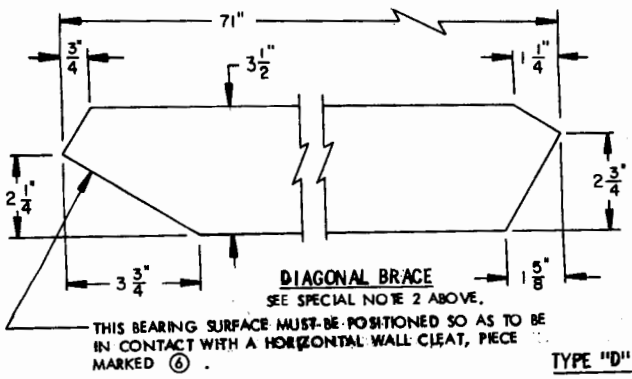
SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN TEN (10) UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 30 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.

2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪ AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

4. CAUTION: A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



TYPE "D" K-BRACE

KEY NUMBERS

① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION SO TOP EDGE IS 4-1/2" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.

② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).

④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".

⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.

⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.

⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.

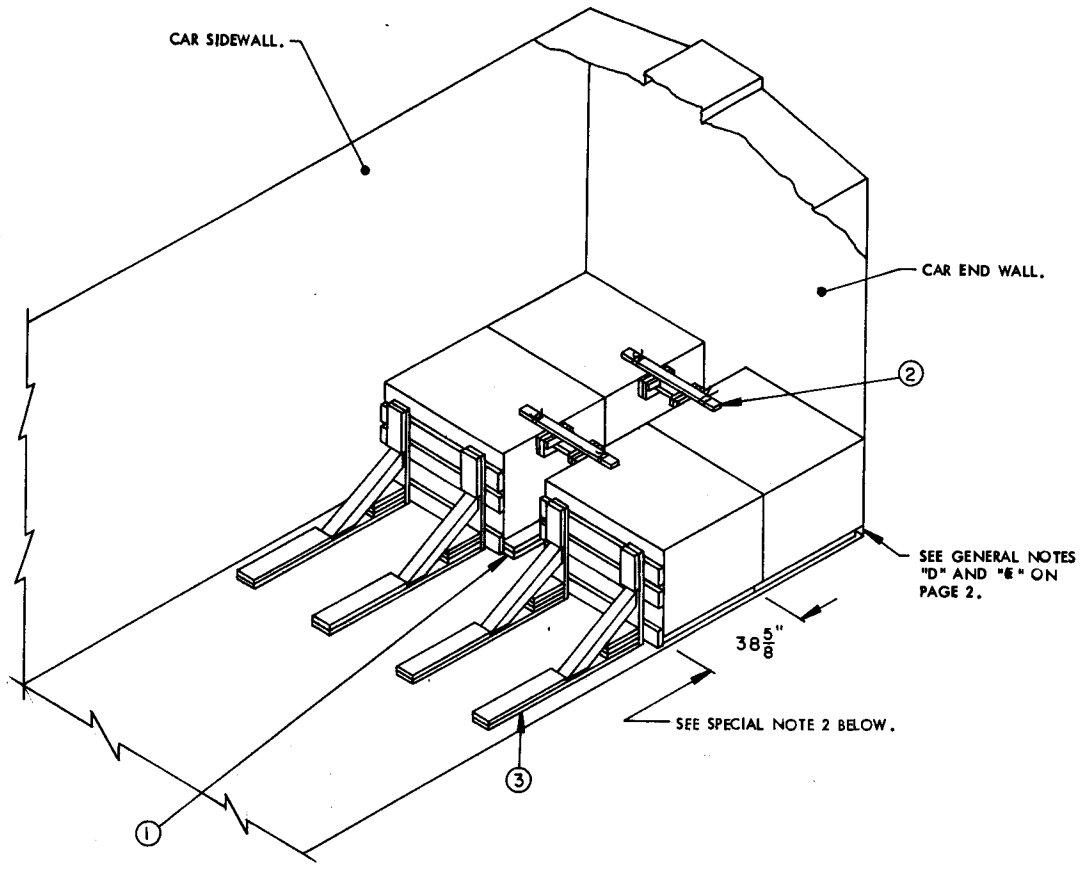
⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.

⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.

⑩ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.

⑪ SPACER CLEAT, 2" X 4" X 17-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.

⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 3 ARE NOT EXCEEDED. NOTE THAT LOADS BRACED WITH KNEE BRACES ARE LIMITED TO UNITS POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR.
3. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS OR 4 PALLET UNITS.
4. HOLD-DOWN CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM HORIZONTAL PIECE OF A KNEE BRACE ASSEMBLY. THE PROPER MATERIAL SIZE AND PLACEMENT WILL BE AS DEPICTED BY THE "CENTER GATE E" DETAIL ON PAGE 44.
5. IF DESIRED, "ANTI-SWAY BRACE A" MAY BE USED IN LIEU OF THE NAILED FLOORLINE BLOCKING, PIECE MARKED (1). IN ORDER TO PREVENT DISPLACEMENT, THE LAST ANTI-SWAY BRACE MUST BE EITHER WIRE TIED TO A PALLET POST OR A DOUBLED 2" X 4" X 12" LONG PIECE MUST BE PLACED AGAINST IT AND NAILED TO THE CAR FLOOR W/2-16d NAILS EACH LAYER.

KEY NUMBERS

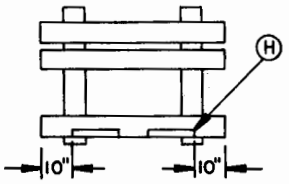
(1) FLOORLINE BLOCKING, 2" X 6" X 36" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/6-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 AT LEFT. SEE GENERAL NOTE "K" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 13. WIRE TIE TO THE CENTER STRAPPING BOARD OF THE UNIT AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 42.

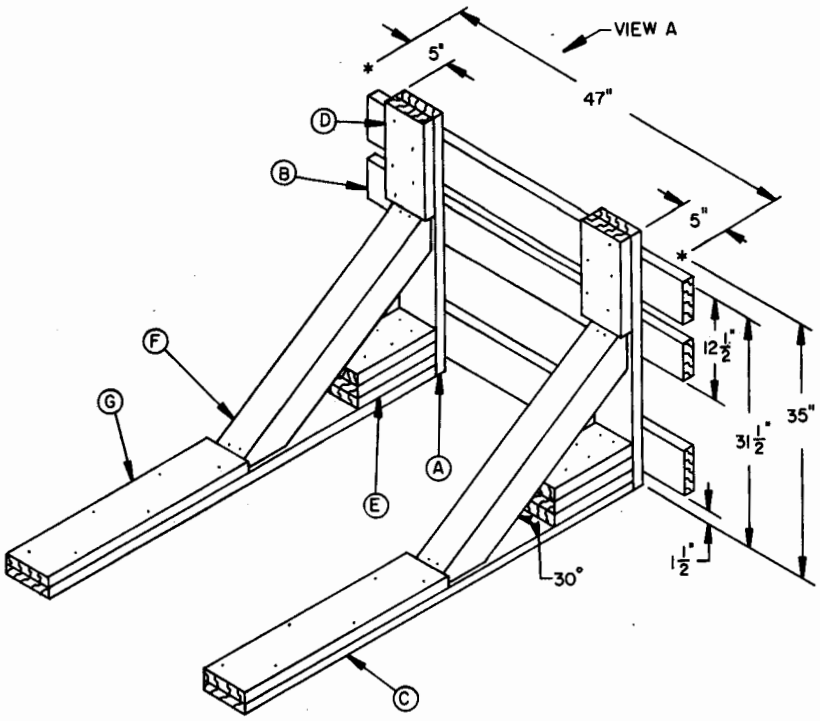
(3) KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 33 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.

CONTAINERS LENGTHWISE

TYPICAL LCL LOAD USING KNEE BRACE METHOD OF PARTIAL-LAYER BRACING



VIEW A



KNEE BRACE ASSEMBLY

KEY LETTERS

(A) VERTICAL PIECE, 2" X 6" X 35" (2 REQD).

(B) HORIZONTAL PIECE, 2" X 6" X 47" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(C) FLOOR CLEAT, 2" X 6" X 69" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "P" ON PAGE 2.

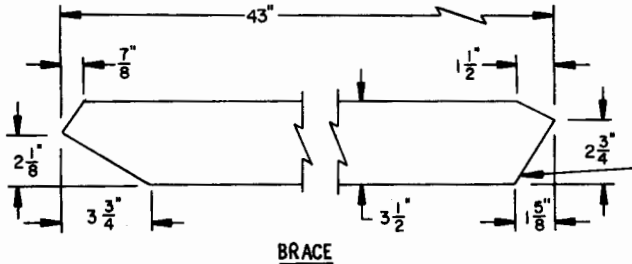
(D) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.

(E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.

(F) BRACE, 4" X 4" X 43" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH JOINT.

(G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.

(H) HOLD-DOWN CLEAT, 2" X 3" X 10" (DOUBLED) (2 REQD). SEE "VIEW A" ABOVE FOR LOCATION GUIDANCE. NAIL THE FIRST PIECE TO THE BOTTOM HORIZONTAL PIECE, PIECE MARKED (B), W/2-10d NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.



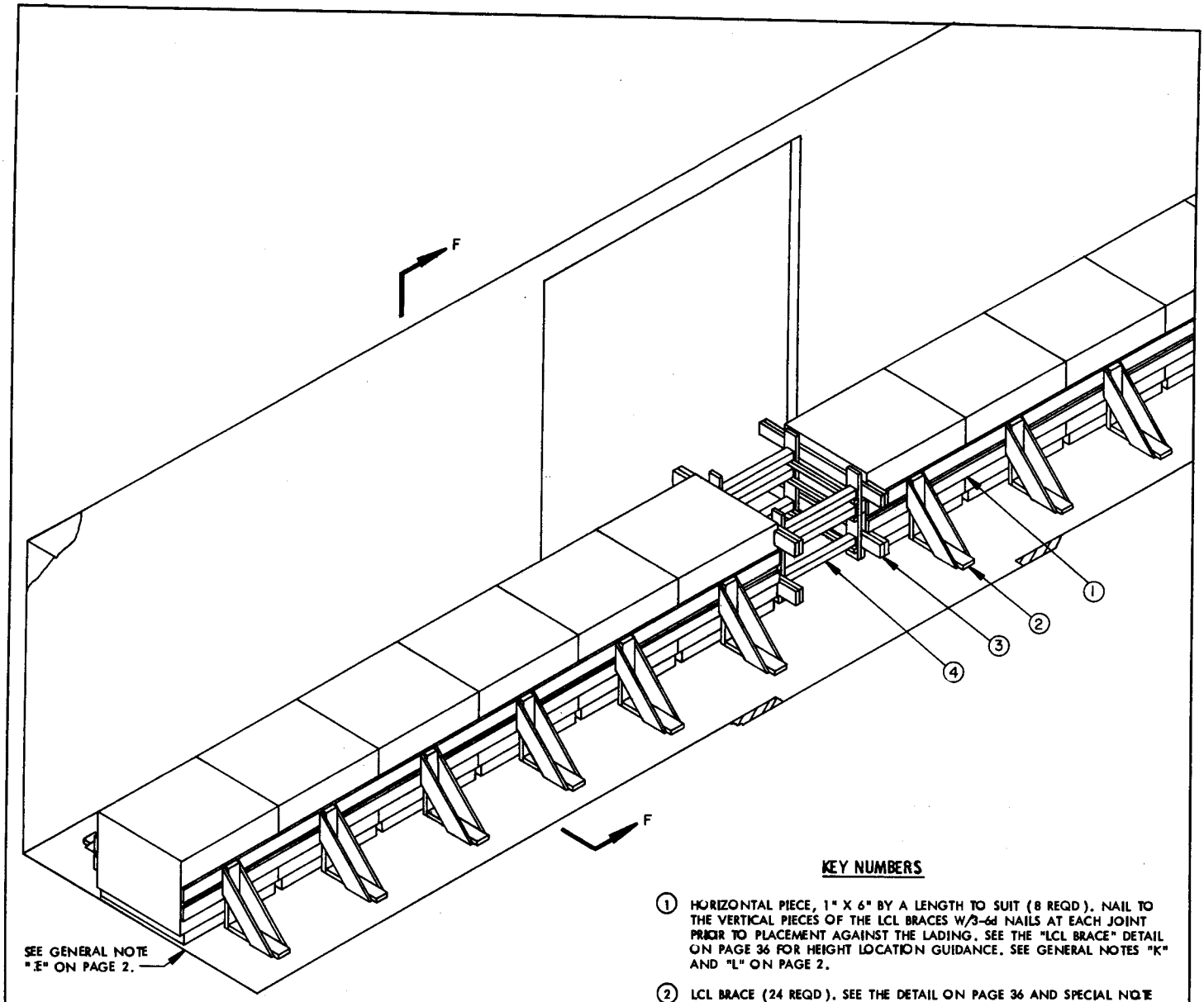
BRACE

4" X 4" MATERIAL

THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE MARKED (A).

CONTAINERS LENGTHWISE

TYPICAL LCL LOAD USING KNEE BRACE METHOD OF PARTIAL-LAYER BRACING



ISOMETRIC VIEW

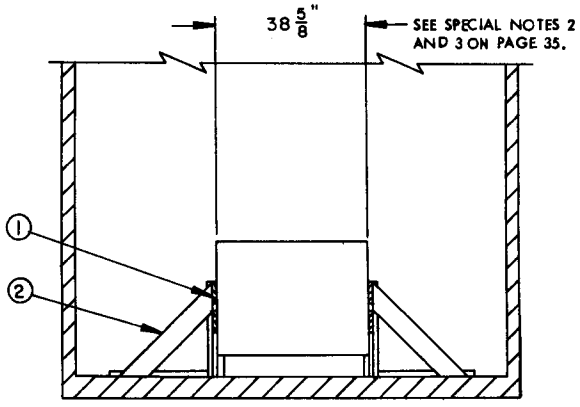
KEY NUMBERS

(1) HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 36 FOR HEIGHT LOCATION GUIDANCE. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

(2) LCL BRACE (24 REQD). SEE THE DETAIL ON PAGE 36 AND SPECIAL NOTE 4 ON PAGE 37. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "P" ON PAGE 2.

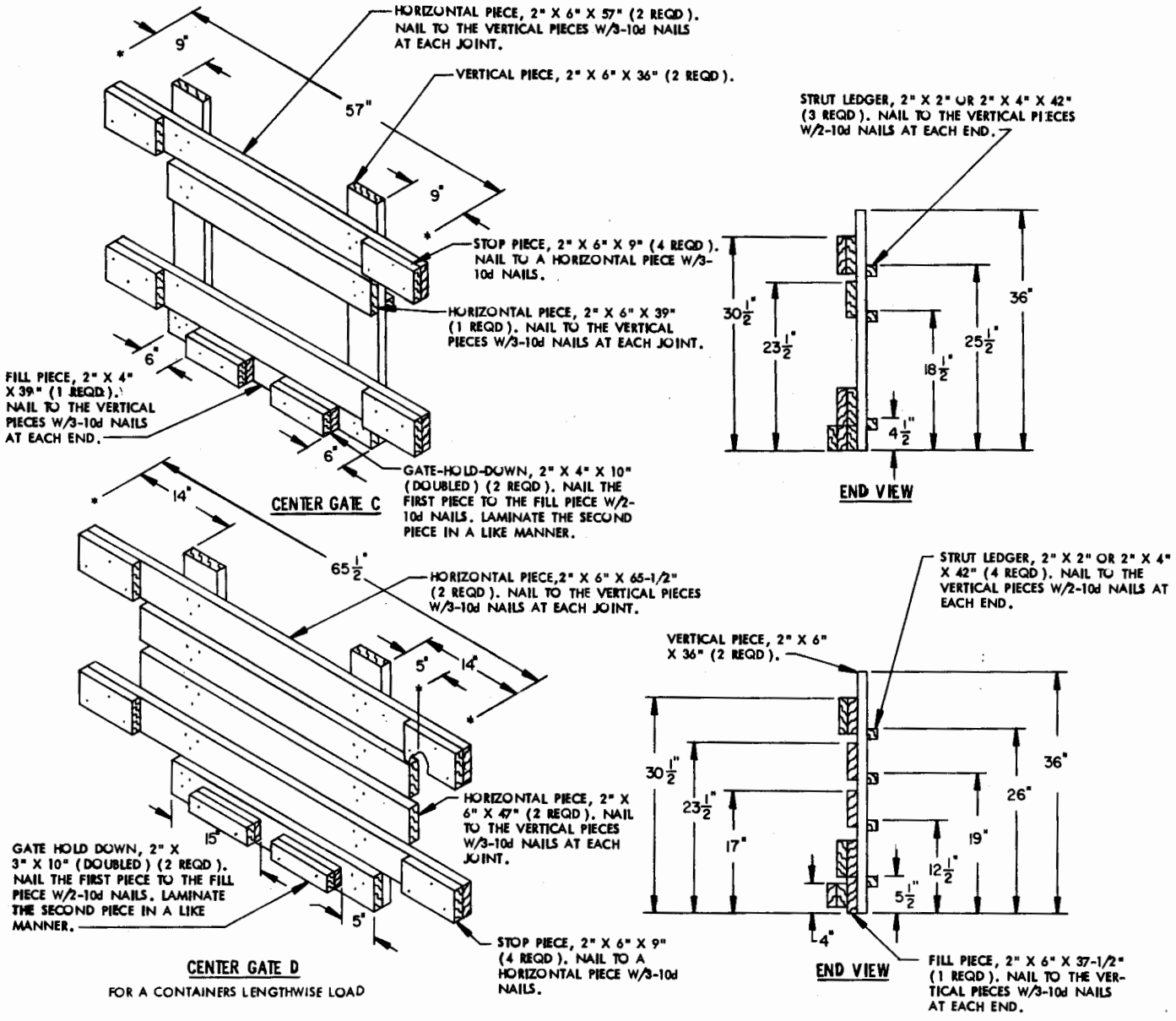
(3) CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 35. SEE SPECIAL NOTES 2, 3 AND 6 ON PAGE 35.

(4) STRUT, 4" X 4" BY CUT TO FIT (REF: 36") (6 REQD). TOENAIL TO PIECES MARKED (3) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J" AND "R" ON PAGE 2 AND GENERAL NOTE "S" ON PAGE 3.



SECTION F-F

TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD



BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	324	162
2" X 2"	21	7
2" X 4"	14	10
2" X 6"	134	134
4" X 4"	216	288
NAILS	NO. REQD	POUNDS
6d (2")	144	1
8d (2-1/2")	288	4-1/2
10d (3")	112	2
16d (3-1/2")	192	4-1/2

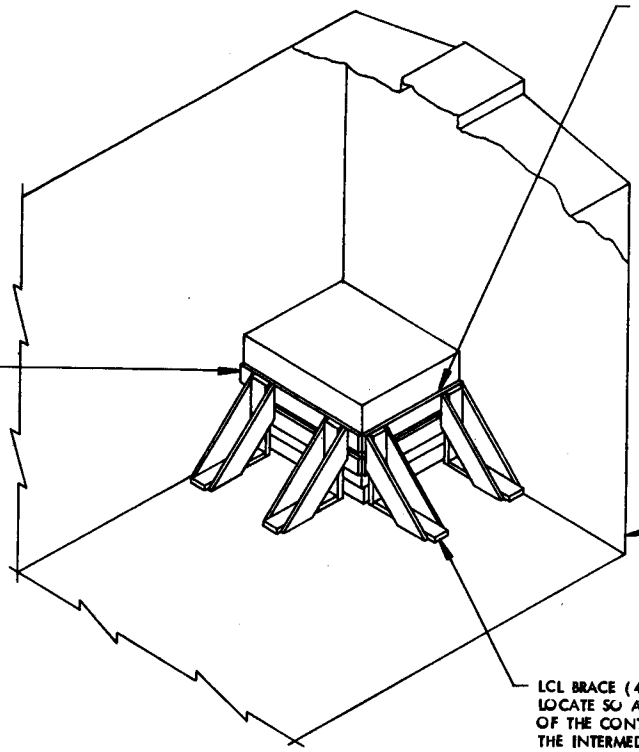
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND LENGTHS MAY BE USED. SEE SPECIAL NOTE 2.
2. A 1-WIDE CONTAINERS CROSSWISE LOAD IN A 50'-6" LONG CAR IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR A NINE (9) UNIT CROSSWISE LOAD IN A 40'-6" LONG CAR, AND FOURTEEN (14) UNIT LOAD IN A 60'-8" LONG CAR.
3. ONE-WIDE LOADING PROCEDURES ARE ALSO APPLICABLE FOR CONTAINERS LENGTHWISE LOADS. ELEVEN (11) PALLET UNITS CAN BE LOADED IN A 40'-6" LONG CAR, FOURTEEN (14) CAN BE LOADED IN A 50'-6" LONG CAR AND EIGHTEEN (18) CAN BE LOADED IN A 60'-8" LONG CAR.
4. ONE (1) LCL BRACE WILL BE USED AT EACH END/SIDE OF EACH PALLET UNIT. THE BRACES WILL BE CENTERED ON THE END/SIDE OF EACH UNIT.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT POSITIONING AND THEREFORE ARE ONLY TYPICAL.
6. CENTER GATE "D" WILL BE USED IN LIEU OF CENTER GATE "C" WHEN A CONTAINERS LENGTHWISE LOAD IS BEING SHIPPED.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	25,764 LBS
DUNNAGE		1,214 LBS
TOTAL WEIGHT		26,978 LBS

TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD



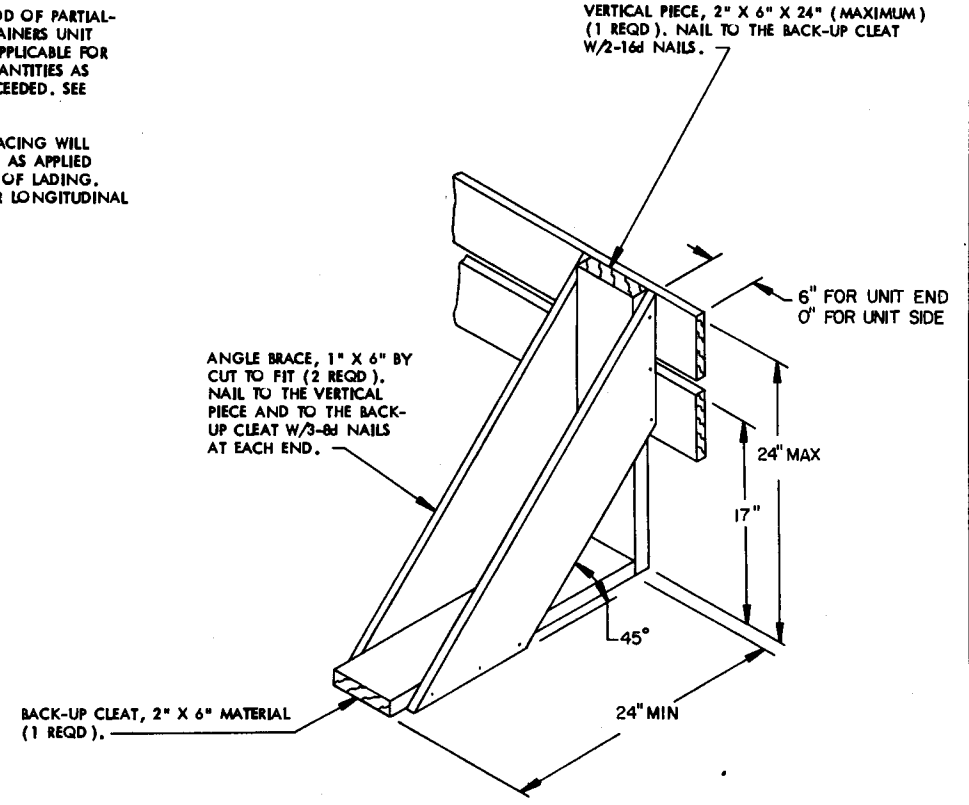
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTES "P." AND "D" ON PAGE 2.

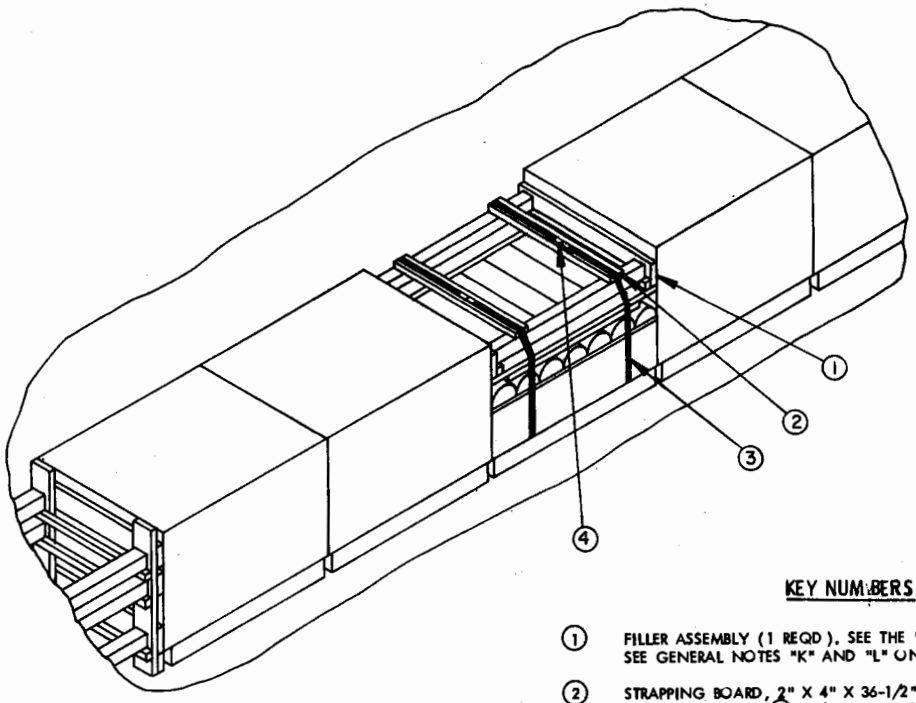
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL . A LENGTHWISE CONTAINERS UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE CONTAINERS UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3.

3. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.



LCL BRACE

TYPICAL LCL LOAD USING LCL BRACE METHOD OF PARTIAL-LAYER BRACING



POSITIONING OF PARTIAL CONTAINERS-CROSSWISE UNIT IN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CONTAINERS CROSSWISE LOAD.

2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CROSSWISE POSITIONED COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD IS LIMITED TO EITHER THREE LAYERS OR TWO LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 2-LAYER UNIT WITHIN A LOAD. IF A 3-LAYER UNIT IS TO BE SHIPPED WITHIN A LOAD, THE "FILLER ASSEMBLY A" AS DETAILED BELOW, WILL BE USED IN LIEU OF "FILLER ASSEMBLY B".

3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SEVEN (7) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/4-20PM1002, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.

4. THE FILLERS AS REFERENCED IN SPECIAL NOTE 3 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.

5. THE "POSITIONING OF PARTIAL CONTAINERS-CROSSWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

(CONTINUED AT RIGHT)

KEY NUMBERS

① FILLER ASSEMBLY (1 REQD). SEE THE "FILLER ASSEMBLY B" DETAIL BELOW. SEE GENERAL NOTES "K" AND "L" ON PAGE 2.

② STRAPPING BOARD, 2" X 4" X 36-1/2" (2 REQD). NAIL TO THE STRUTS OF PIECE MARKED ① W/3-10d NAILS AT EACH END.

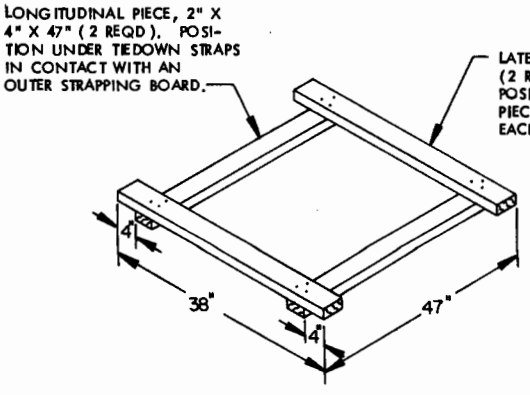
③ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.

④ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "M" ON PAGE 2.

(SPECIAL NOTES CONTINUED)

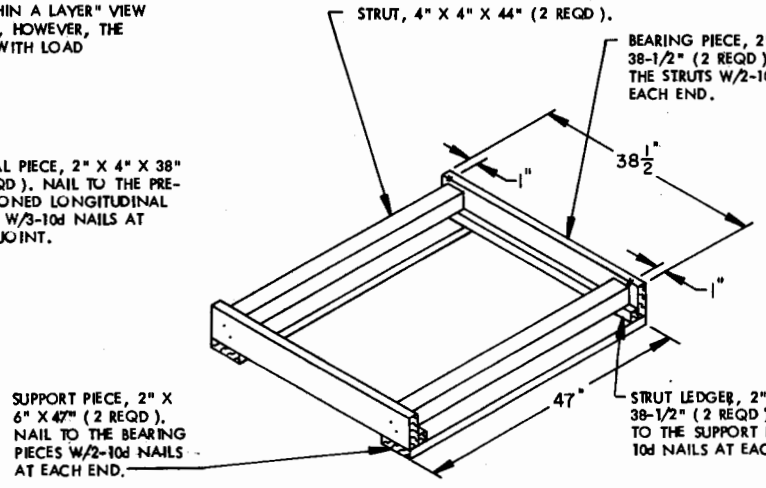
6. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

7. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 40 MAY BE MORE ECONOMICAL.



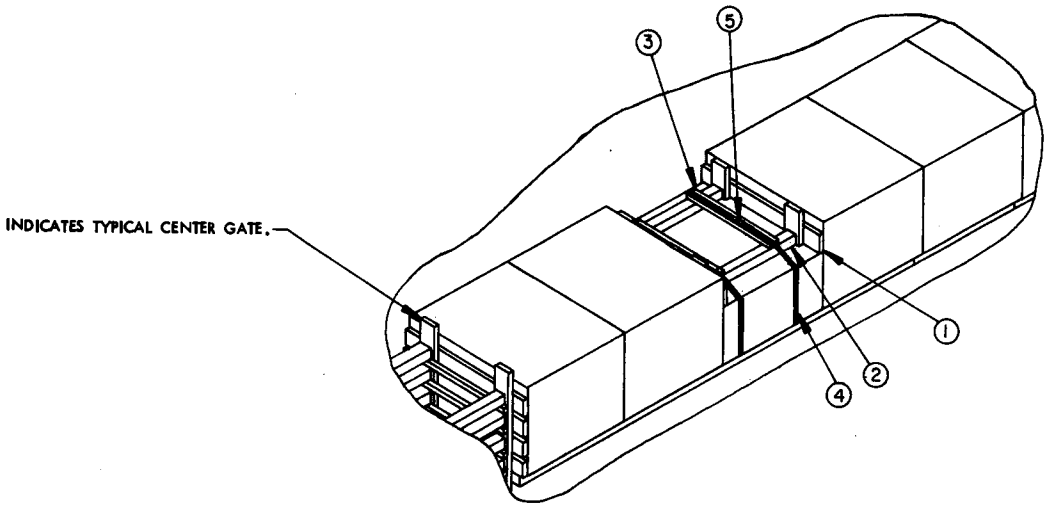
FILLER ASSEMBLY A

THIS SPACER ASSEMBLY IS DESIGNED FOR USE IN THE PLACE OF ONE OMITTED LAYER OF CONTAINERS. NOTE THAT IT MUST BE ASSEMBLED IN PLACE.



FILLER ASSEMBLY B

THIS ASSEMBLY IS DESIGNED FOR USE IN THE PLACE OF TWO OMITTED LAYERS OF CONTAINERS.



POSITIONING OF PARTIAL CONTAINERS - LENGTHWISE UNIT WITHIN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CONTAINERS-LENGTHWISE LOAD.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SEVEN (7) CONTAINERS OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/4-20PM1002, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
4. THE FILLERS AS REFERENCED IN SPECIAL NOTE 3 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
5. THE "POSITIONING OF PARTIAL CONTAINERS-LENGTHWISE UNIT IN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

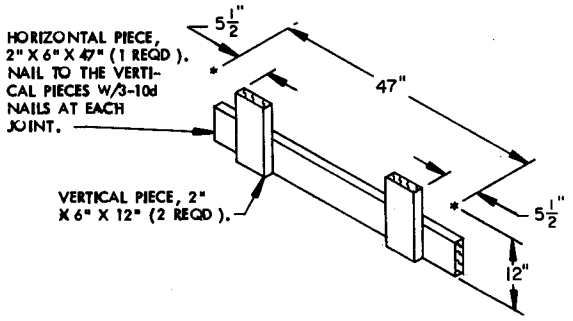
(1) PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTES "K" AND "L" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.

(2) STRUT, 4" X 4" X 32-5/8" (2 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED (1), W/2-16d NAILS AT EACH END.

(3) STRAPPING BOARD, 2" X 4" X 34" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED (2), W/3-10d NAILS AT EACH END.

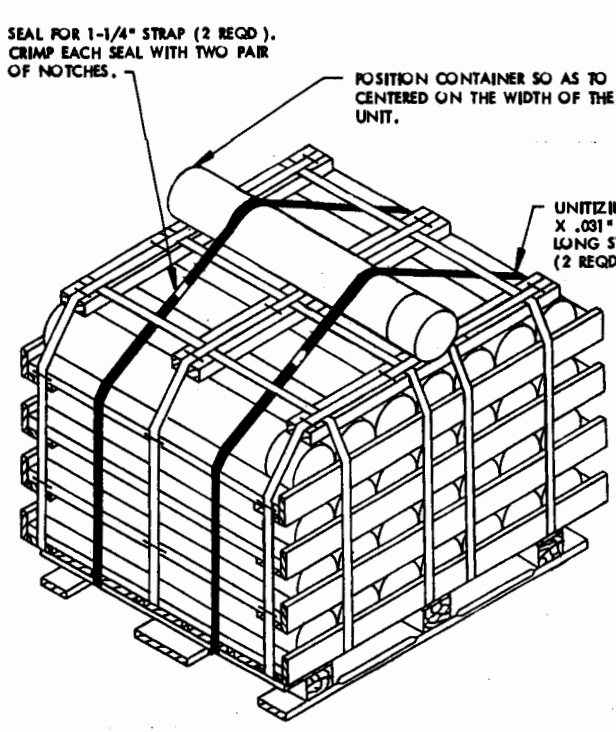
(4) UNITIZING STRAP, 1-1/4" X .031" X .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.

(5) SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "M" ON PAGE 2.

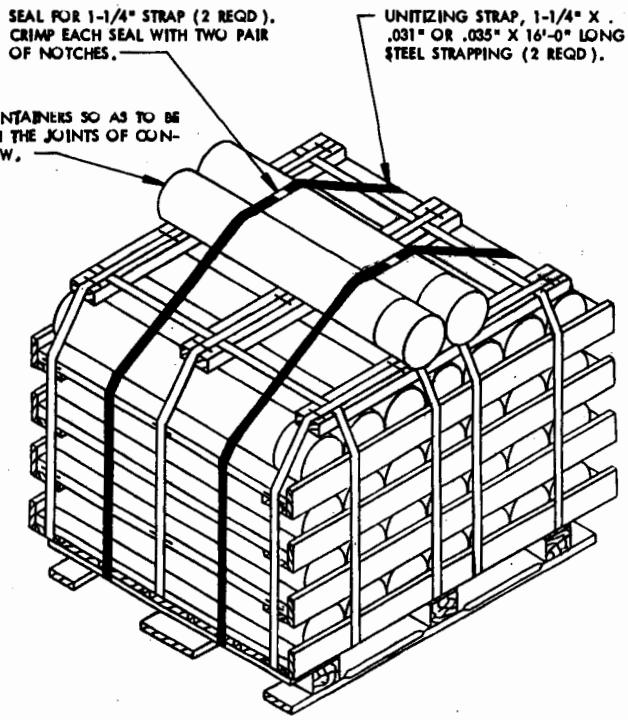


PARTIAL-UNIT GATE A

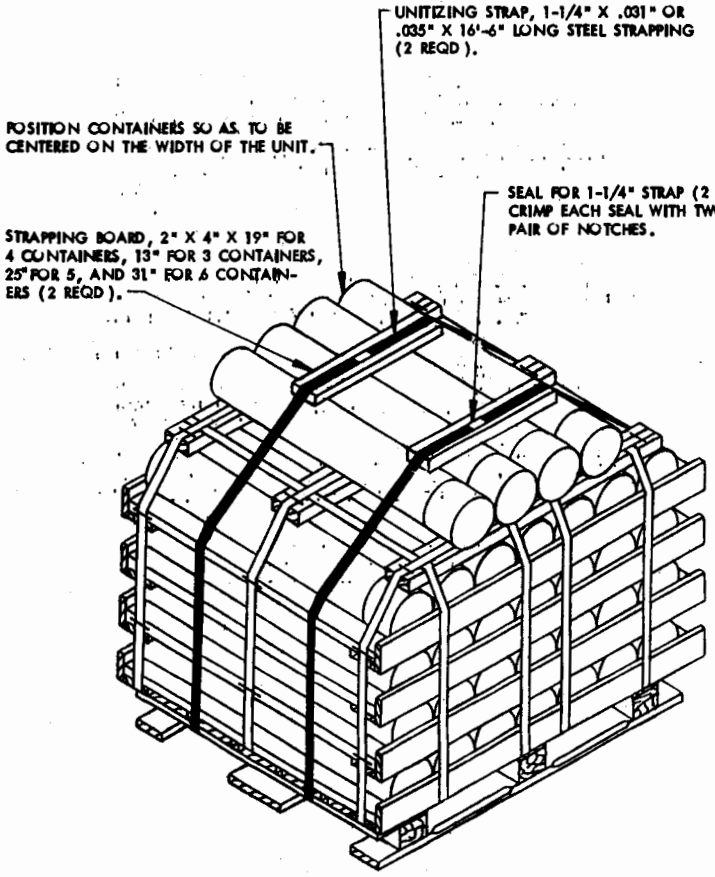
THE LOCATION OF THE VERTICAL PIECES MUST BE ADJUSTED TO MATCH THE VERTICAL PIECES OF THE APPLICABLE CENTER GATE, SO AS TO ALIGN WITH THE DUNNAGE PIECES OF A UNIT.



SECUREMENT OF ONE CONTAINER



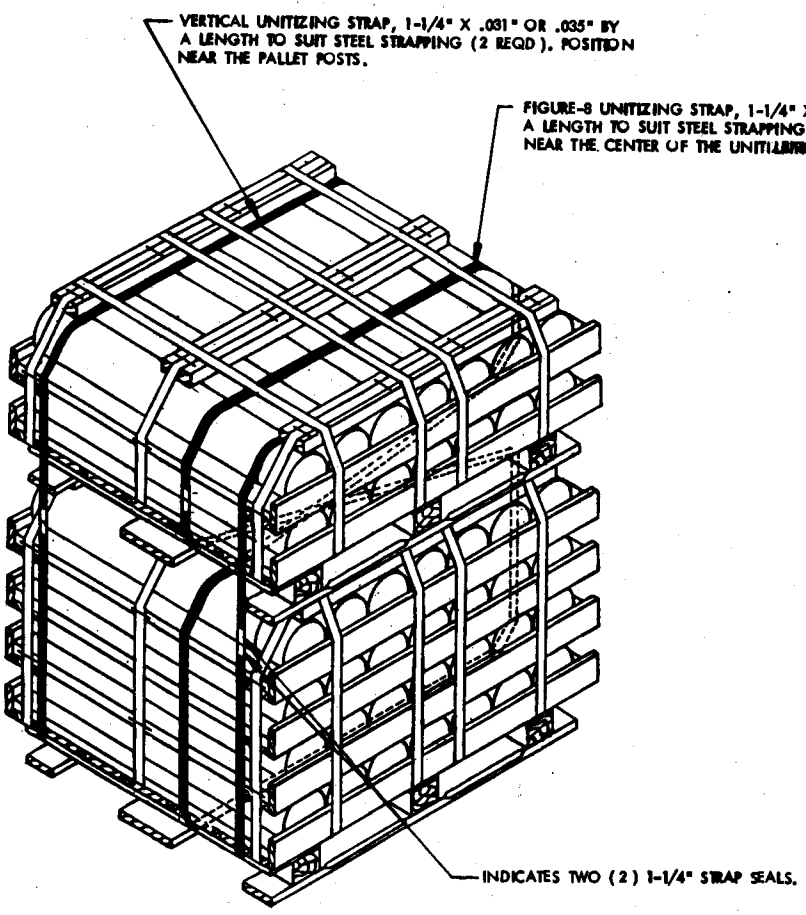
SECUREMENT OF TWO CONTAINERS



SECUREMENT OF FOUR CONTAINERS

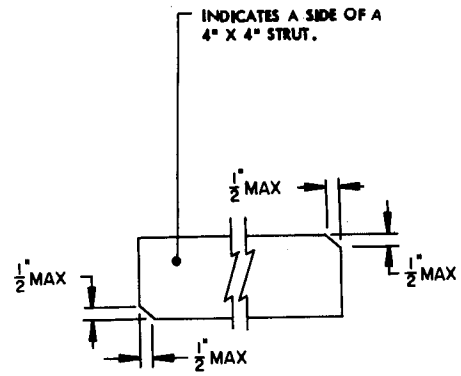
SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT EITHER ON TOP OF A LOAD AS SHOWN ON PAGE 40 OR WITHIN A LAYER AS SHOWN ON PAGES 37 AND 38.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION WOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED.
4. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.
5. THE UNITIZING STRAP MAY BE THREADED UNDERNEATH THE TOP LAYER OF THE PALLET UNIT, IF DESIRED, IN LIEU OF AROUND THE COMPLETE UNIT, AS SHOWN.



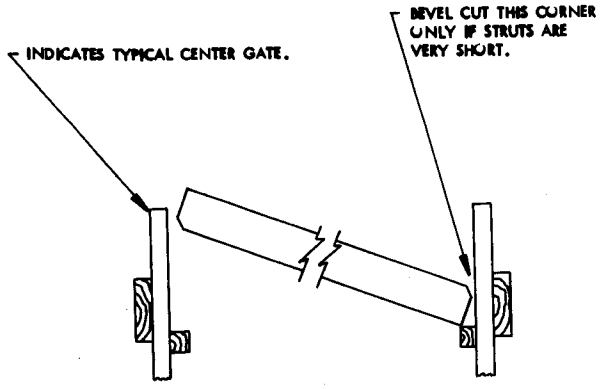
SECUREMENT OF PARTIAL UNIT ON TOP

THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CONTAINERS CROSSWISE LOAD. CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN TWO (2) TWO (2) LAYERS OF CONTAINERS. FOR SHIPMENT OF MORE THAN TWO LAYERS OF CONTAINERS, OR AN ALTERNATIVE METHOD FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGES 37 AND 38.



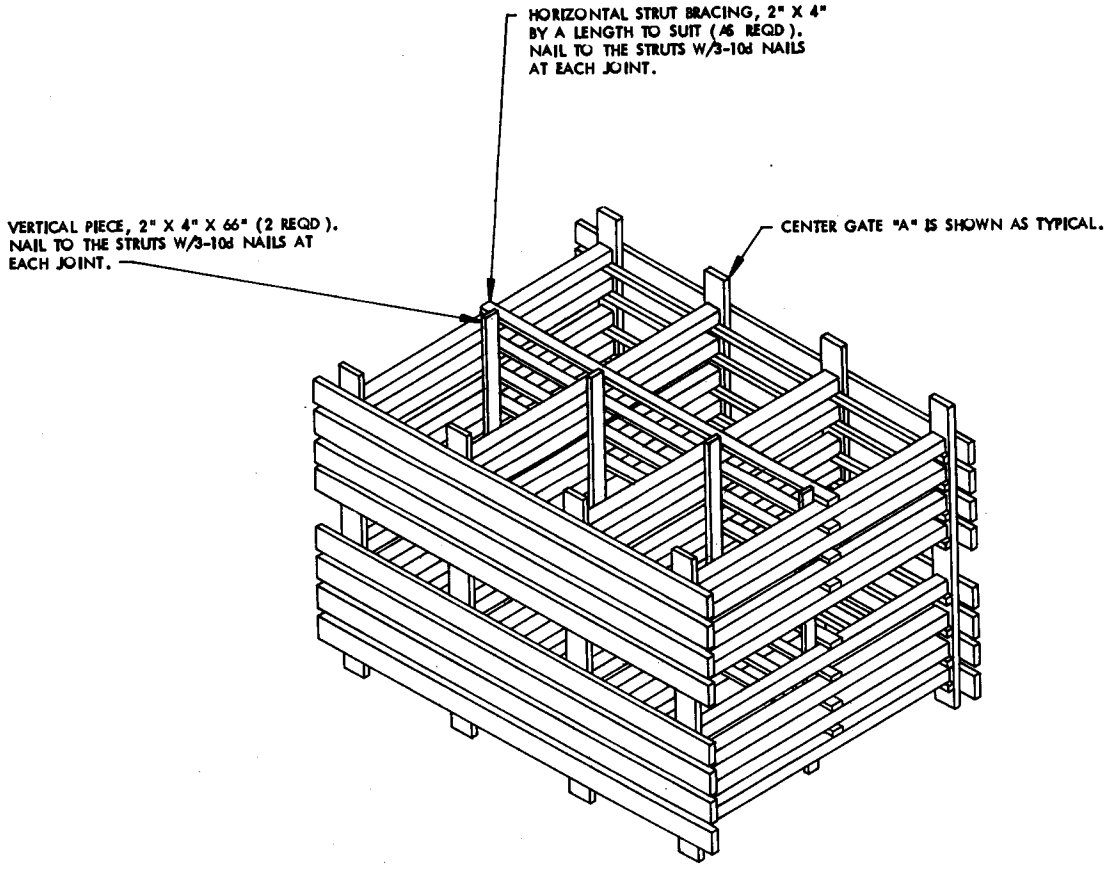
BEVEL-CUT

BEVEL CUTTING THE STRUTS AS SPECIFIED WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE FIT". CAUTION: DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2").



STRUT INSTALLATION

SEE GENERAL NOTE "S" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



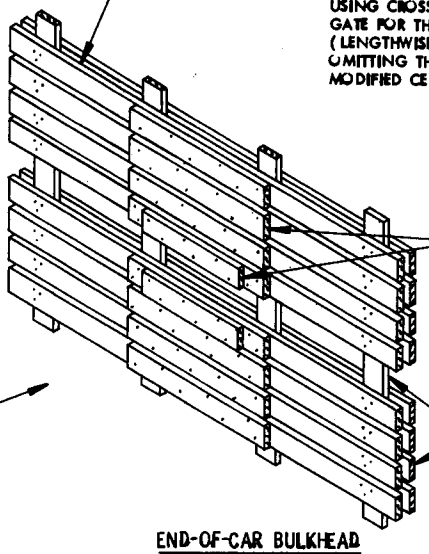
TYPICAL STRUT BRACING

SEE GENERAL NOTE "R" ON PAGE 2.

FILLER PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (ONE REQUIRED FOR EACH HORIZONTAL PIECE ON THE CENTER GATE). ALIGN WITH THE HORIZONTAL PIECES AND NAIL TO THE VERTICAL PIECES OF THE CENTER GATE W/3-10d NAILS AT EACH JOINT.

NOTE O:

IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "A", AS DETAILED ON PAGE 12, IS SHOWN AS TYPICAL.



SHIM MATERIAL, 6" WIDE PLYWOOD OR DIMENSIONAL LUMBER OF A THICKNESS AND LENGTH AS REQUIRED TO FILL THE VOID BETWEEN THE CAR END WALL AND THE BULKHEAD. NAIL TO THE FILLER PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

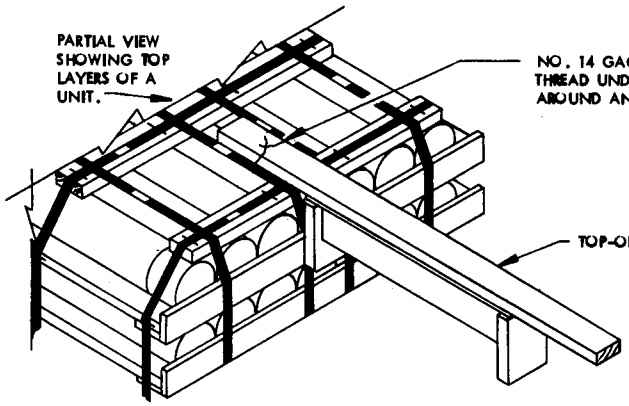
THESE 2" X 6" HORIZONTAL PIECES AND 2" X 6" VERTICAL PIECES ARE PART OF THE MODIFIED CENTER GATE. SEE "NOTE O " ABOVE.

END-OF-CAR BULKHEAD

SEE "NOTE O " ABOVE.

PARTIAL VIEW SHOWING TOP LAYERS OF A UNIT.

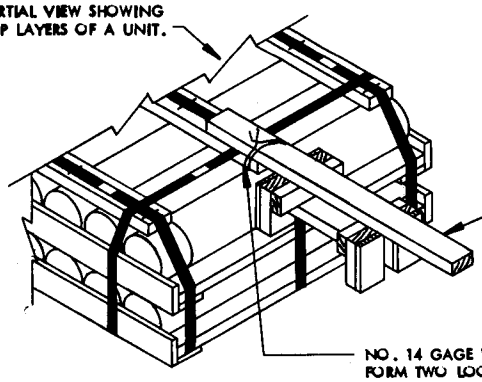
NO. 14 GAGE WIRE BY A LENGTH TO SUIT. THREAD UNDER THE TIEDOWN STRAPS AND TWIST AROUND ANTI-SWAY BRACE.



TOP-OF-LOAD ANTI-SWAY BRACE "B".

TIE WIRE APPLICATION B

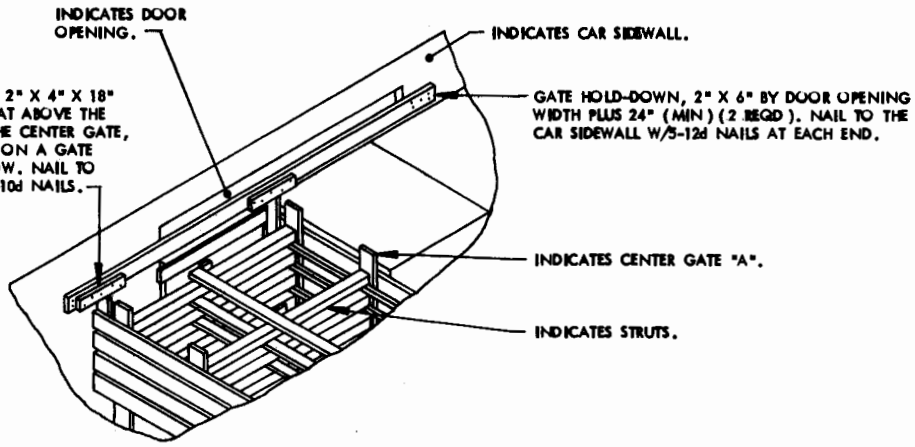
PARTIAL VIEW SHOWING TOP LAYERS OF A UNIT.



TOP OF LOAD ANTI-SWAY BRACE "A".

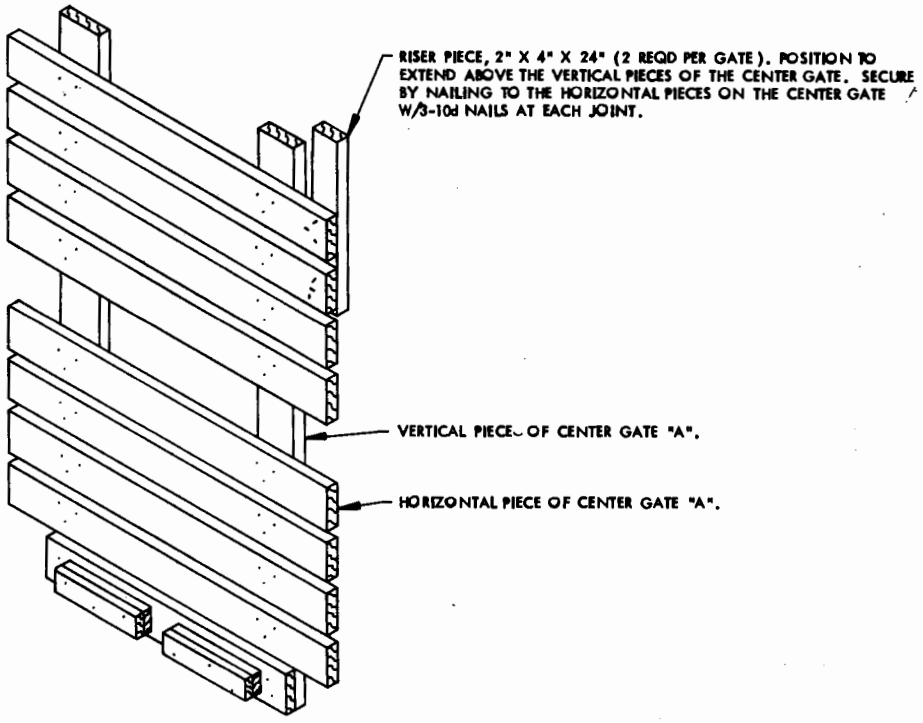
NO. 14 GAGE WIRE BY LENGTH TO SUIT. FORM TWO LOOPS AROUND THE STRAPPING BOARD AND THE ANTI-SWAY BRACE AND TWIST TO PREVENT DISLODGEMENT.

TIE WIRE APPLICATION A



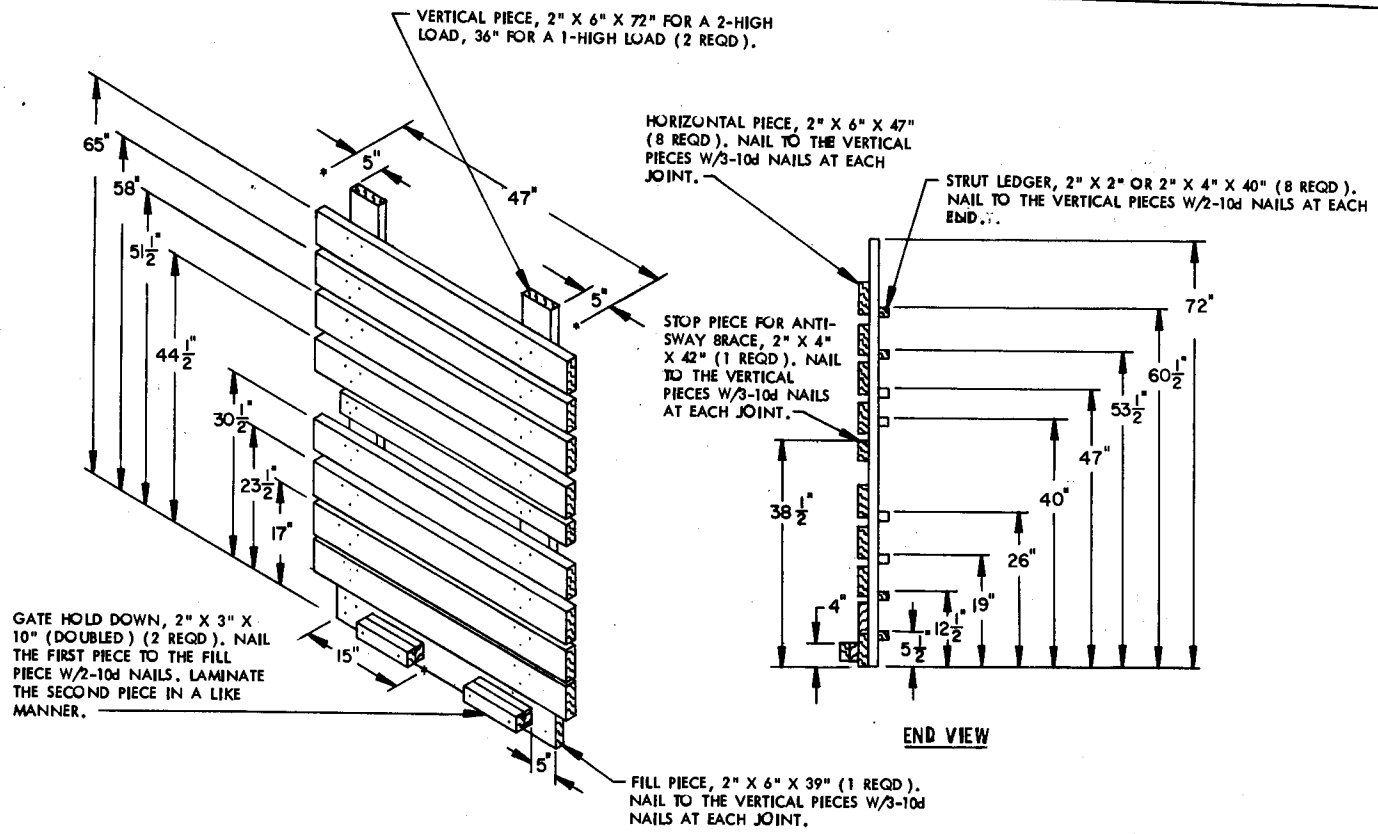
ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE "A" HOLD-DOWN WHICH CAN BE USED, IF DESIRED, PROVIDING THE CAR HAS NAILABLE SIDEWALLS. THIS METHOD MAY BE APPLIED IN LIEU OF USING THE GATE HOLD-DOWN PIECES WHICH ARE PART OF A CENTER GATE. NOTE: IN THE EVENT THAT NEITHER CENTER GATE IS LOCATED IN OR NEAR THE DOORWAY AREA, THE GATE HOLD-DOWN CLEAT MAY BE DOUBLED AND NAILED TO THE CAR SIDEWALL TO PROVIDE A HOLD-DOWN; OMIT THE 2" X 6" GATE HOLD-DOWN PIECES.



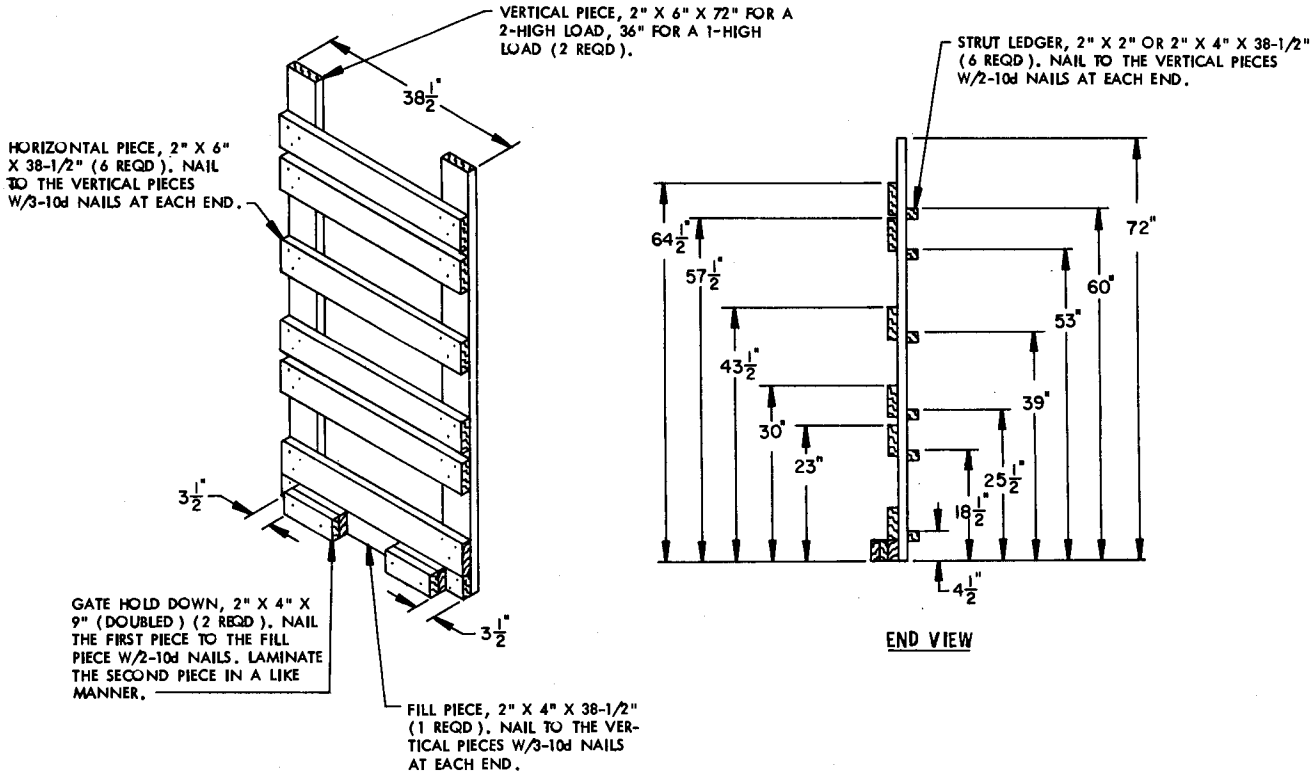
CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THIS VIEW ARE APPLICABLE FOR THE CENTER GATES "A" WHICH HAVE THE VERTICAL PIECES INSET FROM THE END OF THE HORIZONTAL PIECES AS SHOWN ABOVE. THE RISER PIECE WILL PROVIDE A MEANS FOR THE GATE TO CONTACT THE GATE HOLD-DOWN AS SHOWN IN THE "ALTERNATIVE GATE HOLD-DOWN" DETAIL AT THE TOP OF THIS PAGE.



CENTER GATE E

THIS GATE IS FOR USE IN THE LOAD SHOWN ON PAGE 4. SEE SPECIAL NOTE 6 ON PAGE 5.

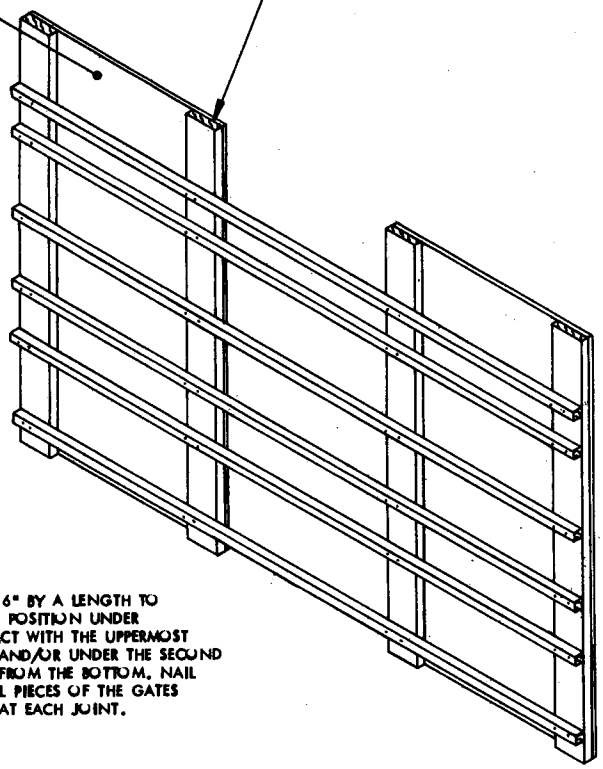


CENTER GATE F

THIS CENTER GATE IS FOR USE IN THE LOAD SHOWN ON PAGE 6. SEE SPECIAL NOTE 6 ON PAGE 7.

PLYWOOD, 1/2" THICK BY THE UNIT WIDTH OR LENGTH BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6". NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT WIDTH IF THE LENGTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 4 OR UNIT LENGTH IF THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 6. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.

INDICATES A TYPICAL CAR WIDTH CENTER GATE, WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.

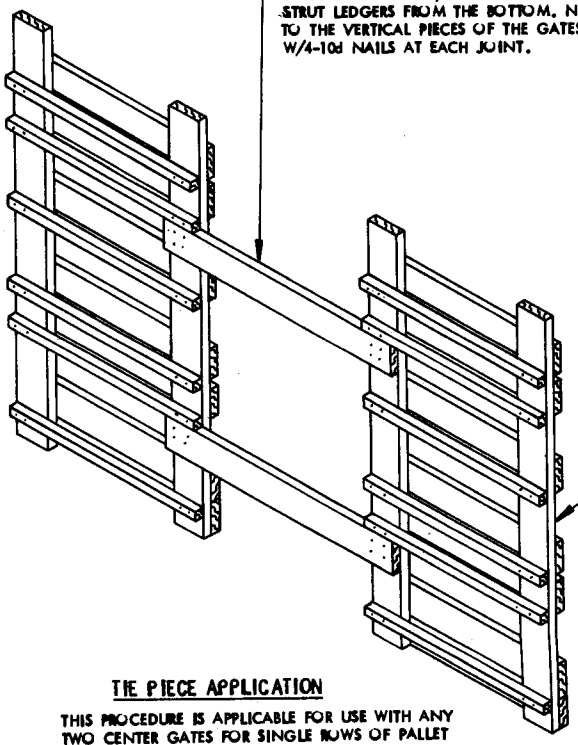


GATE HOLD DOWN PIECE MUST BE SECURED TO THE PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE

CENTER GATE "B" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW.

TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (2 REQD). POSITION UNDER AND IN CONTACT WITH THE UPPERMOST STRUT LEDGERS AND/OR UNDER THE SECOND STRUT LEDGERS FROM THE BOTTOM. NAIL TO THE VERTICAL PIECES OF THE GATES W/4-10d NAILS AT EACH JOINT.



INDICATES A TYPICAL CENTER GATE FOR A SINGLE ROW (2 REQD). SEE THE "CENTER GATE E" OR "CENTER GATE F" DETAIL ON PAGE 44 DEPENDING UPON THE ORIENTATION OF THE PALLET UNITS.

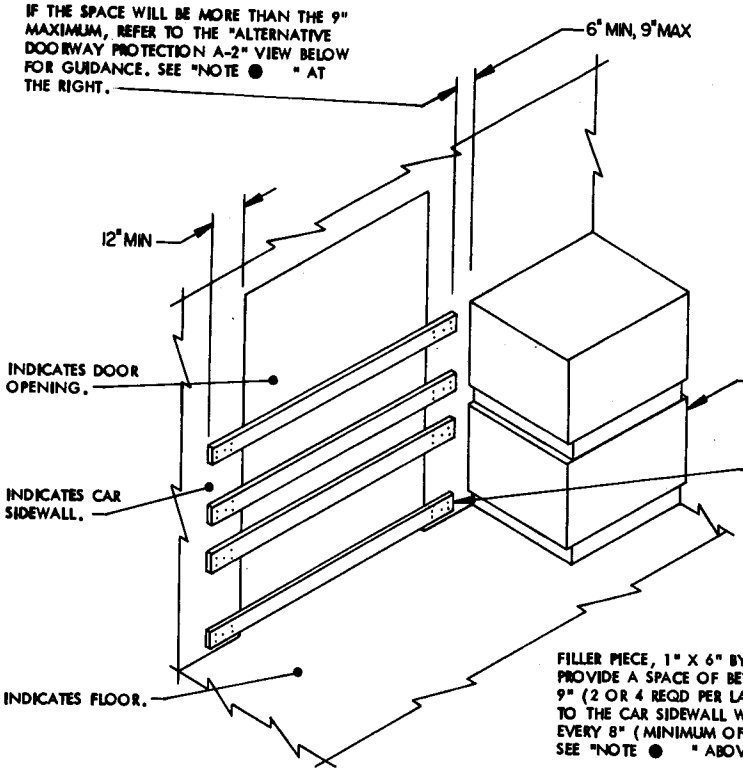
TIE PIECE APPLICATION

THIS PROCEDURE IS APPLICABLE FOR USE WITH ANY TWO CENTER GATES FOR SINGLE ROWS OF PALLET UNITS. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

IF THE SPACE WILL BE MORE THAN THE 9" MAXIMUM, REFER TO THE "ALTERNATIVE DOORWAY PROTECTION A-2" VIEW BELOW FOR GUIDANCE. SEE "NOTE ● " AT THE RIGHT.

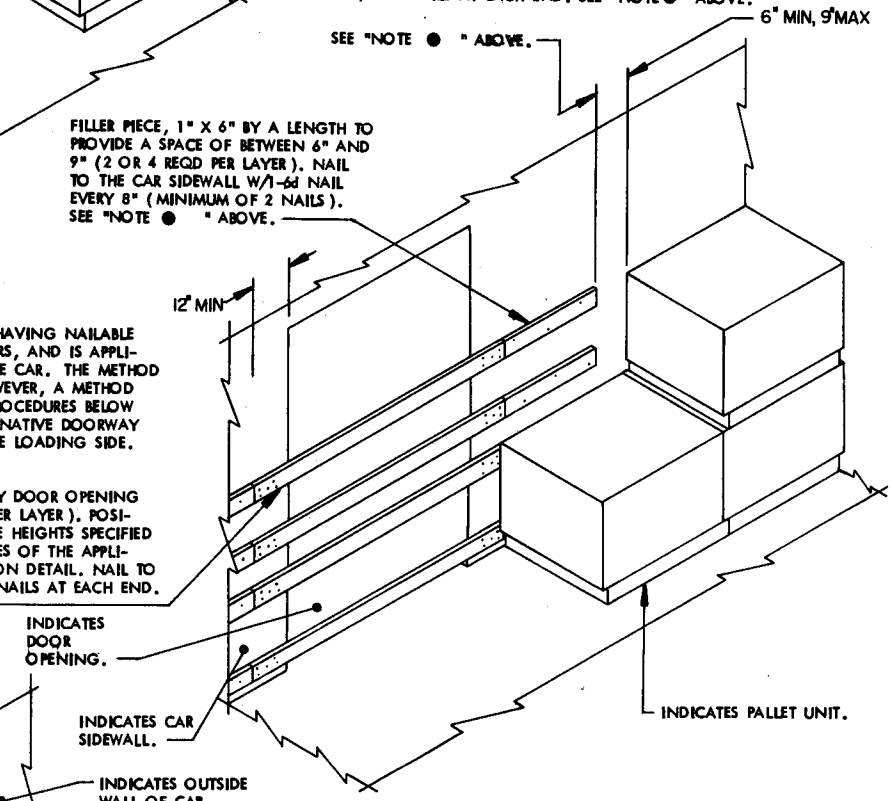
NOTE ● :

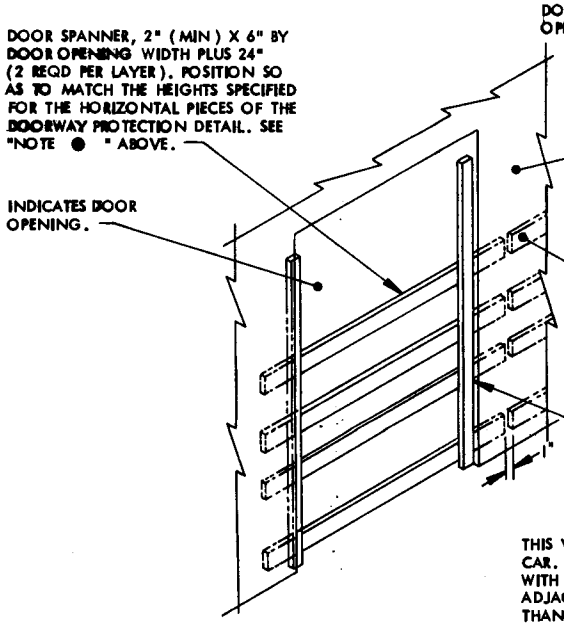
THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT.



ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR. THE "ALTERNATIVE DOORWAY PROTECTION C" PRODECURES ON PAGE 47 MAY BE USED ON THE LOADING SIDE.



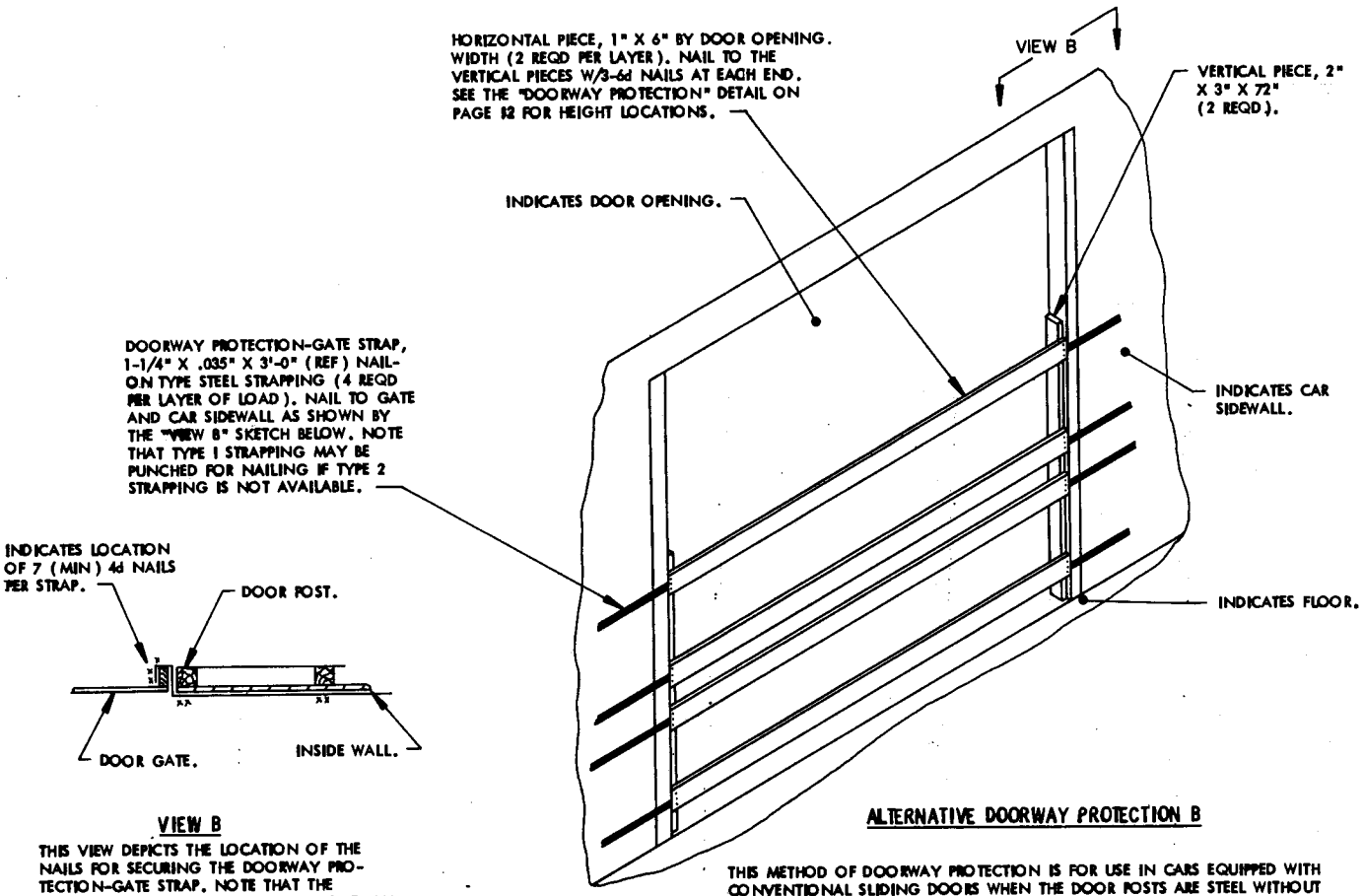


ALTERNATIVE DOORWAY PROTECTION A-2

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. SEE THE NOTE UNDER THE "A-1" PROCEDURES.

ALTERNATIVE DOORWAY PROTECTION A-3

THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT FROM OUTSIDE OF THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET UNITS MUST BE POSITIONED APPROXIMATELY 1-3/4" (REF) FROM THE CAR SIDEWALL (1/4" MORE THAN THE THICKNESS OF THE DOOR SPANNER PIECES) TO FACILITATE THE INSTALLATION OF THESE DOOR SPANNER PIECES. THE VIEW SHOWN ABOVE IS FOR A TWO LAYER LOAD.

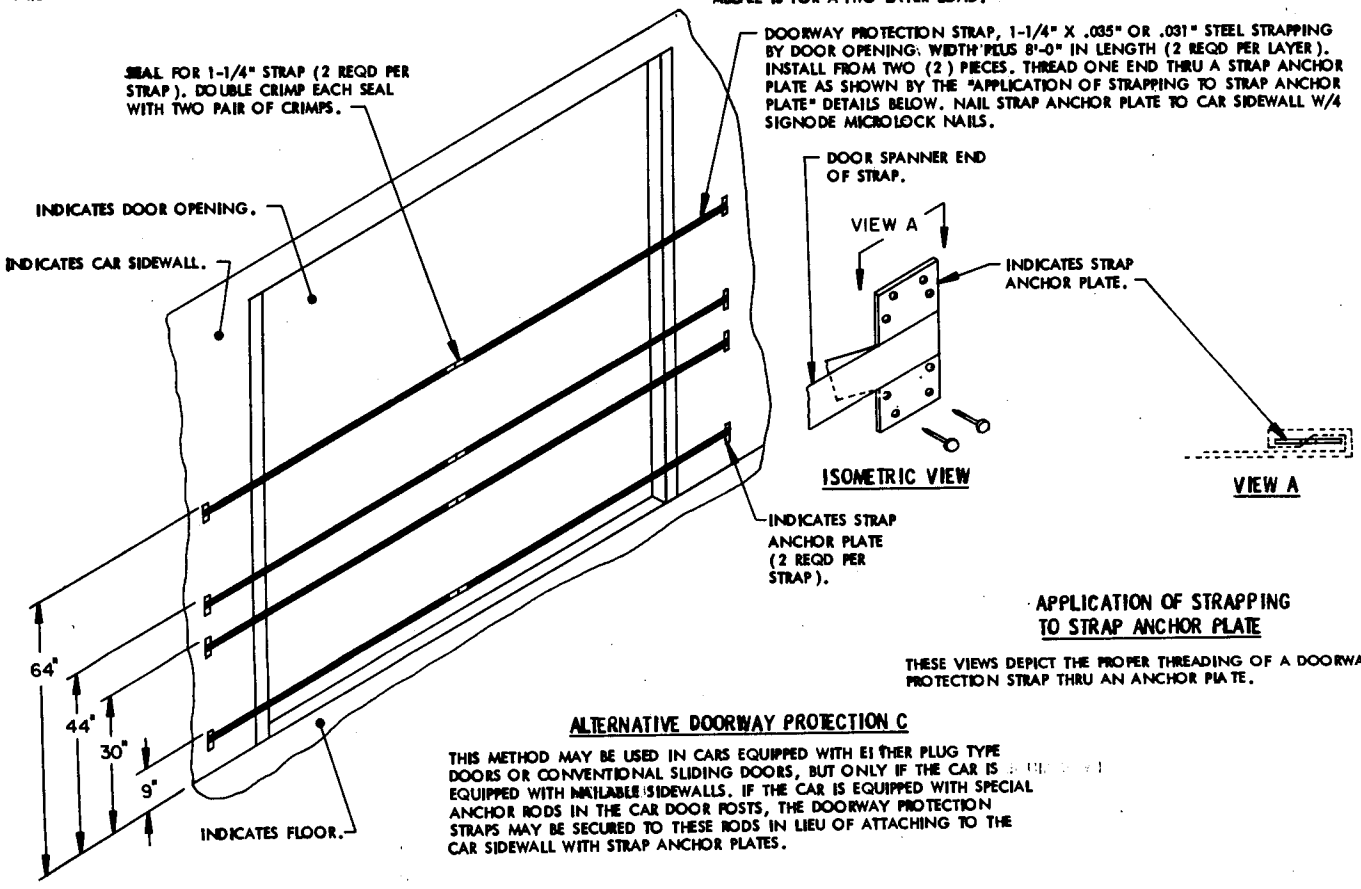


VIEW B

THIS VIEW DEPICTS THE LOCATION OF THE NAILS FOR SECURING THE DOORWAY PROTECTION-GATE STRAP. NOTE THAT THE STRAPS MUST BE APPLIED TO THE CAR SIDEWALL PRIOR TO POSITIONING THE ADJACENT UNITS.

ALTERNATIVE DOORWAY PROTECTION B

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A TWO-LAYER LOAD.

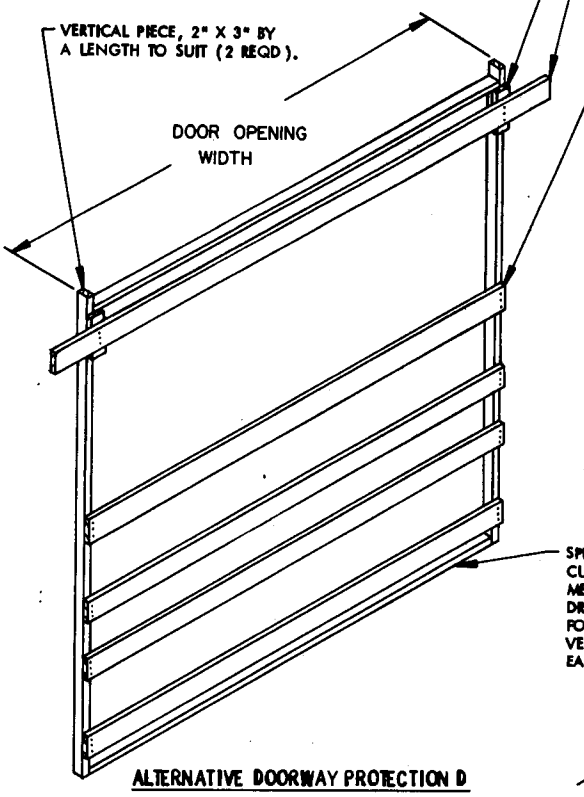


APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

THESE VIEWS DEPICT THE PROPER THREADING OF A DOORWAY PROTECTION STRAP THRU AN ANCHOR PLATE.

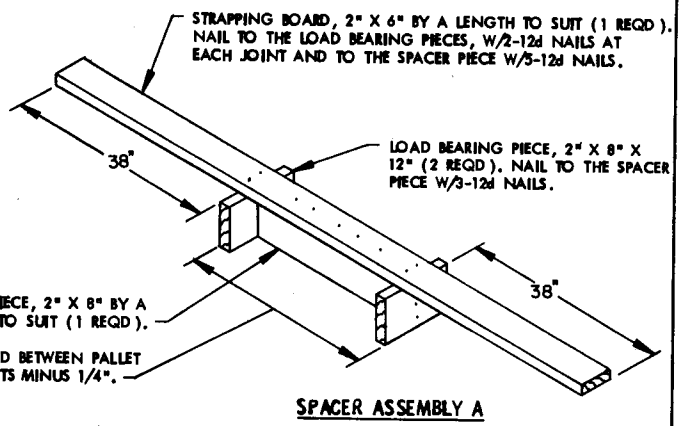
ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD MAY BE USED IN CARS EQUIPPED WITH EITHER PLUG TYPE DOORS OR CONVENTIONAL SLIDING DOORS, BUT ONLY IF THE CAR IS EQUIPPED WITH NAILABLE SIDEWALLS. IF THE CAR IS EQUIPPED WITH SPECIAL ANCHOR RODS IN THE CAR DOOR POSTS, THE DOORWAY PROTECTION STRAPS MAY BE SECURED TO THESE RODS IN LIEU OF ATTACHING TO THE CAR SIDEWALL WITH STRAP ANCHOR PLATES.



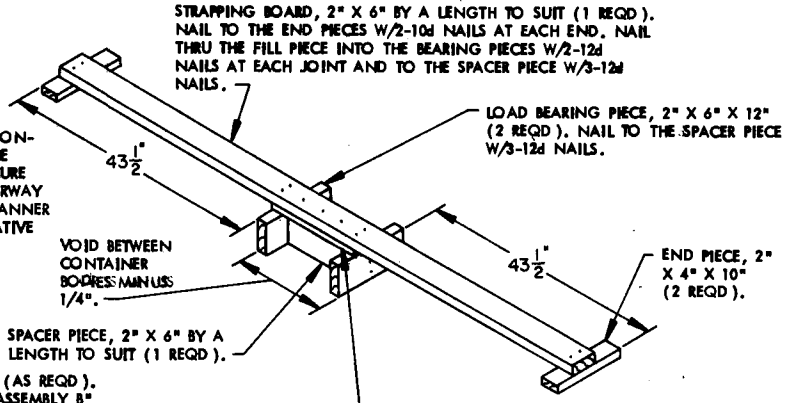
ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 47 FOR GUIDANCE. NOTE THAT THE DOOR SPANNER IN THIS DETAIL MAY BE USED AS A GATE HOLD-DOWN PIECE FOR THE "ALTERNATIVE GATE HOLD DOWN" METHOD SHOWN ON PAGE 43.



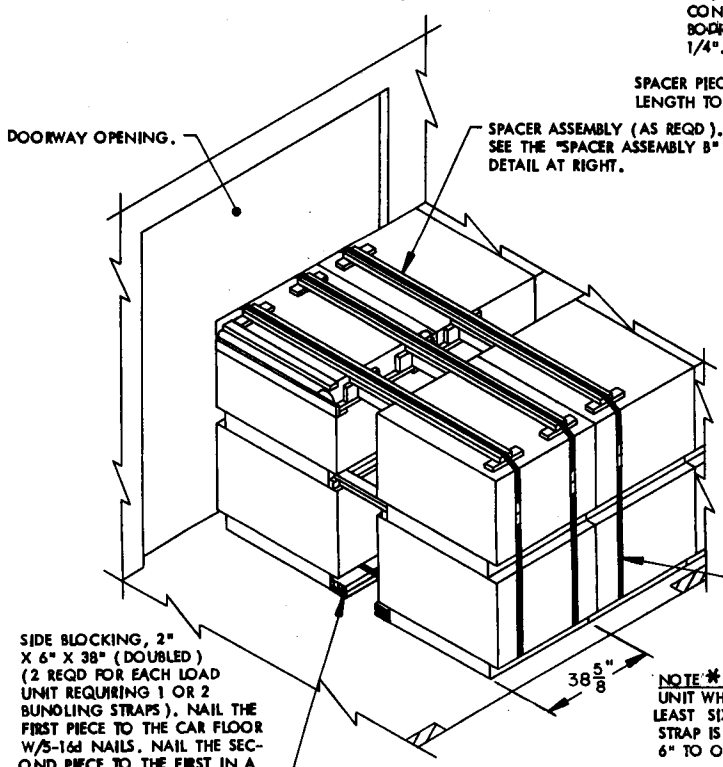
SPACER ASSEMBLY A

THIS ASSEMBLY IS FOR USE IN THE LOAD SHOWN ON PAGE 10 AND MAY BE USED IN THE LOAD SHOWN ON PAGE 6.



SPACER ASSEMBLY B

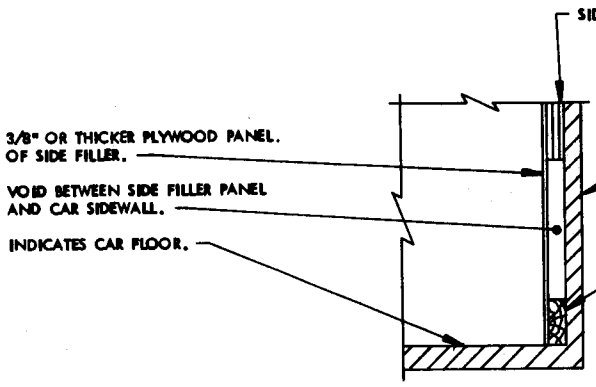
THIS ASSEMBLY IS FOR USE IN THE LOAD SHOWN ON PAGE 10 WHEN THE UNITS ARE POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR AND MAY BE USED IN THE LOAD SHOWN ON PAGE 4.



NOTE *: TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT WIDTH.

ALTERNATIVE DOORWAY PROTECTION E

DETAILS

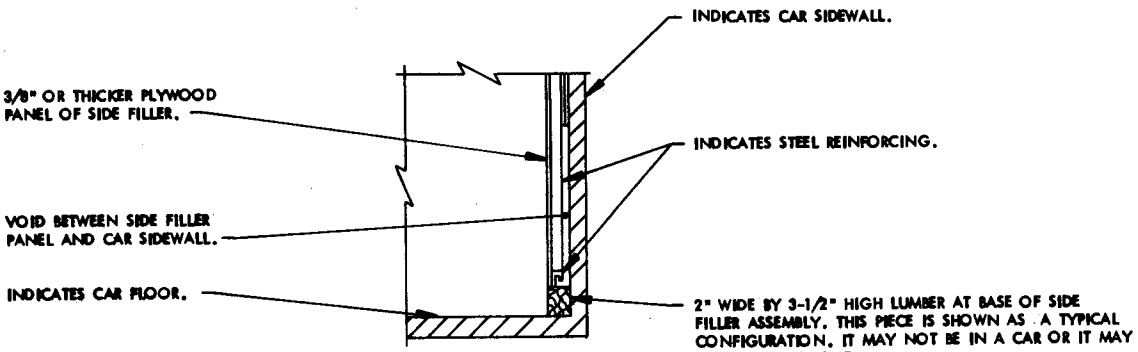


TYPICAL TYPE A

THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR EQUIPPED WITH A STANDARD ADJUSTABLE SIDE FILLER.

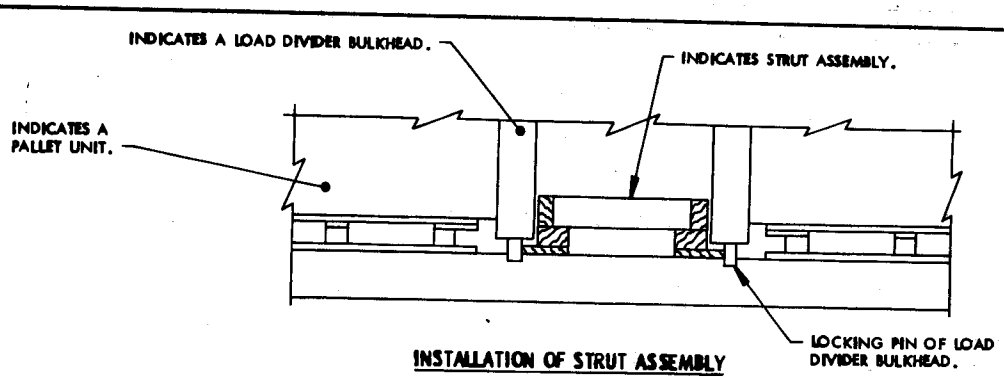
NOTE ◑ :

NAILING OF "FILL PIECES" IS NOT REQUIRED EXCEPT THAT EACH "FILL PIECE" LOCATED NEAREST THE DOOR OPENINGS OF THE CAR WILL BE SECURED AGAINST LONGITUDINAL MOVEMENT W/1-6d NAIL DRIVEN THROUGH THE SIDE FILLER PANEL AND INTO THE "FILL PIECE".



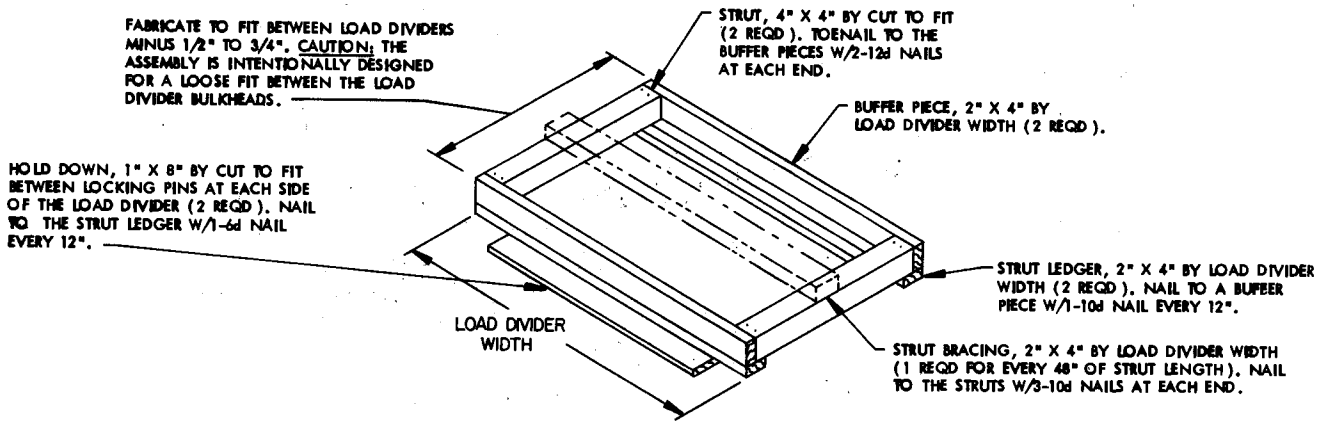
TYPICAL TYPE B

THIS VIEW SHOWS A TYPICAL SECTION OF A CAR EQUIPPED WITH HEAVY DUTY, STEEL REINFORCED, ADJUSTABLE SIDE FILLERS. A "FILL PIECE", AS SHOWN IN THE "TYPICAL TYPE A" DETAIL ABOVE, IS NOT REQUIRED IN CARS SO EQUIPPED.



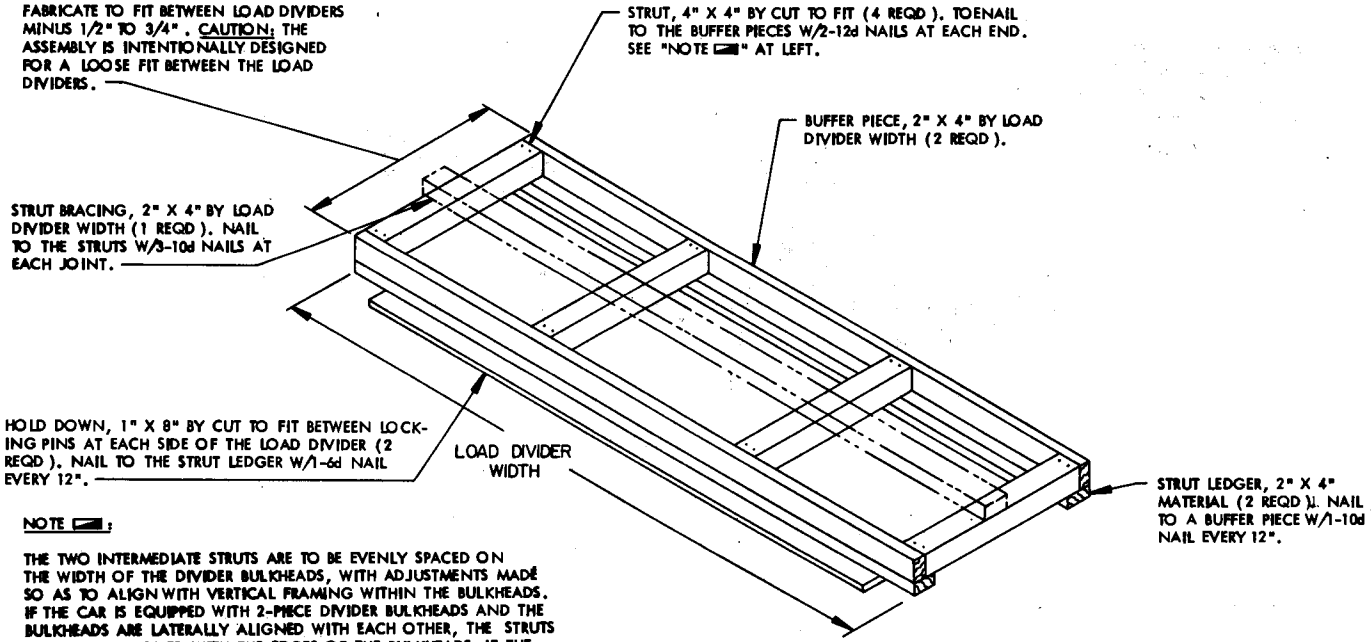
INSTALLATION OF STRUT ASSEMBLY

THIS VIEW SHOWS THE STRUT ASSEMBLY INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS. NOTE THAT 1/2" TO 3/4" (TOTAL) SPACE INTENTIONALLY PROVIDED BETWEEN THE ASSEMBLY AND THE BULKHEADS.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE ▬" BELOW.



NOTE ▬:

THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS. IF THE CAR IS EQUIPPED WITH 2-PIECE DIVIDER BULKHEADS AND THE BULKHEADS ARE LATERALLY ALIGNED WITH EACH OTHER, THE STRUTS SHOULD BE ALIGNED WITH THE EDGES OF THE BULKHEADS; IF THE BULKHEADS ARE NOT ALIGNED, THE "STRUT ASSEMBLY FOR 2-PIECE BULKHEADS" MUST BE USED. SEE THE DETAIL ABOVE.

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IB NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.