APPROVED BY
HAZARDOUS MATERIALS SYSTEMS
(BOE) ASSOCIATION OF AMERICAN
RAILROADS
DATE 7/29/89

LOADING AND BRACING (CL & LCL) IN BOX CARS ⌖ OF PALLETIZED COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS

PA104 SERIES CONTAINER

INDEX

⌖ 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.

DO NOT SCALE

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CLASS	DIVISION	DRAWING	FILE
19	48	4212/7	5PM 1003

PROJECT CA 225/7-85

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 PA 104 CONTAINER WHEN UNITIZED ON A 40" X 44" WOODEN PALLET. SEE THE PICTORIAL VIEW ON PAGE 3. REFER TO THE US DRAWING 19-48-4079/6A20PM1002 FOR UNITIZATION PROCEDURES FOR THE PA 104 CONTAINER.

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. CAUTION: METAL COMPLETE ROUND CONTAINERS MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND END WALLS. IF CARS WITH WOOD SIDEWALLS AND END WALLS ARE NOT AVAILABLE, AND ALL STEEL CARS ARE USED, THE SIDEWALLS AND END WALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE. REFER TO PAGE 34 FOR GUIDANCE.

E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF CONTAINERS AGAINST THE CAR END WALL. LONGITUDINALLY ADJACENT LENGTHWISE UNITS WILL BE POSITIONED WITH BASE END AGAINST BASE END OR BELL END AGAINST BELL END. NOTE THAT PALLET UNITS WILL NOT BE SHIPPED WITH THE CONTAINERS POSITIONED CROSSWISE.

F. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET UNITS OF COMPLETE ROUNDS 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.

G. 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 37 FOR GUIDANCE.

H. 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.

J. 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 THAN 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.

K. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLETIZED UNITS OF COMPLETE ROUNDS PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN. 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 1 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)

L. 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.

M. 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.

N. 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" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD-RESTRAINING FLOOR DUNNAGE APPLICATION.

O. 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 36 FOR GUIDANCE.

P. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.

Q. 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.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

R. 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.

S. 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 PALLETIZED 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.

T. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "STRUT BRACING" DETAIL ON PAGE 36. 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.

U. 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 WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE TOP 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.

(CONTINUED ON PAGE 3)

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(GENERAL NOTES CONTINUED)

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

W. 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)

X. 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 LOADS WHICH ARE 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.

Y. 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.

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

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

AA. 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.

BB. 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 CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.

CC. 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 THE "TYPICAL TYPE A" VIEW ON PAGE 42 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 42, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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(GENERAL NOTES CONTINUED)

DD. 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.

EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B 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 CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B 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 IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 41.

FF. 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 PALLETIZED 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.

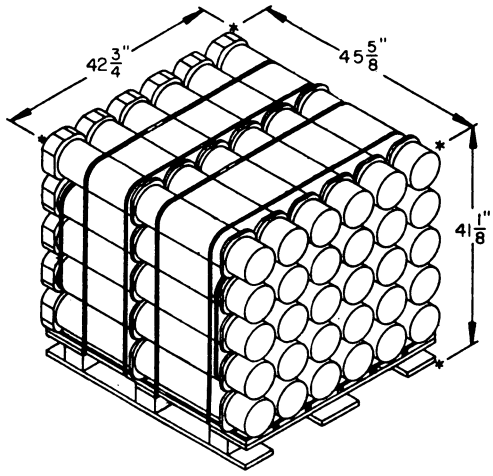
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 18 & 19.

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 14 FOR GUIDANCE.

3. AT LOCATION (S) 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 EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.

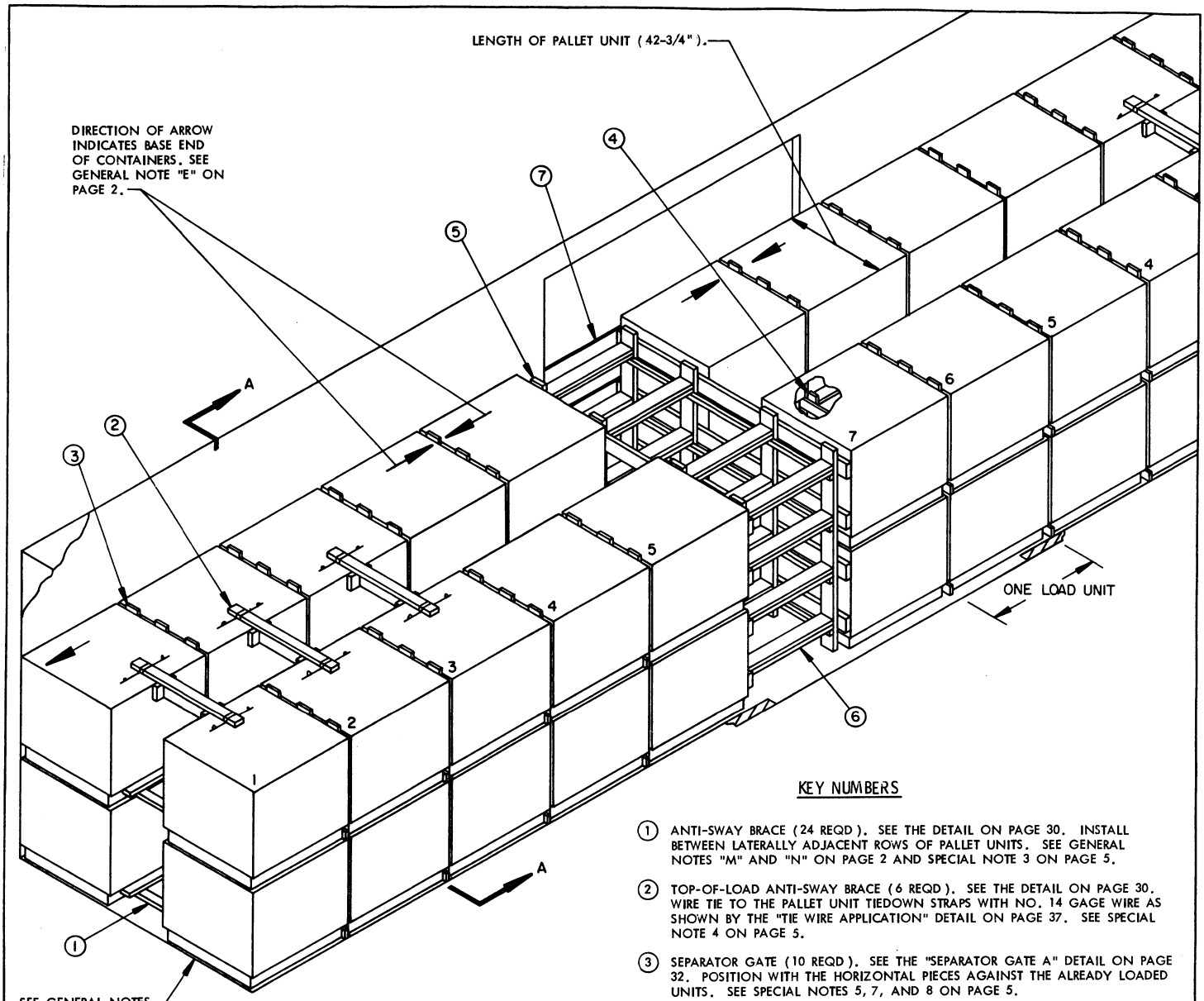
4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 28, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 24.

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

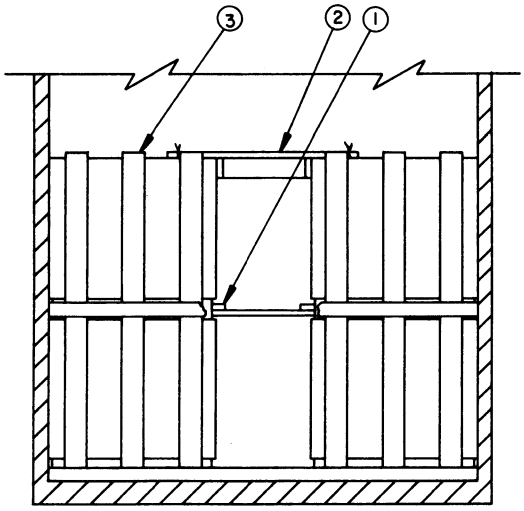


PALLET UNIT

CONTAINER ----30 @ 75 LBS ----2,250 LBS (APPROX)
CUBE ---------- 46.4 CUBIC FEET
GROSS WEIGHT ---------- 2,344 LBS



ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

(1) ANTI-SWAY BRACE (24 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 5.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 5.

(3) SEPARATOR GATE (10 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5, 7, AND 8 ON PAGE 5.

(4) STOP PIECE, 1" X 4" X 48" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED (3), WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 5.

(5) CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 31. SEE SPECIAL NOTES 9 THRU 11 ON PAGE 5.

(6) STRUT, 2" X 6" BY CUT TO FIT (REF: 45") (DOUBLED) (16 REQD). LAMINATE W/1-10d NAIL EVERY 6" AND TOENAIL THE TOP PIECE TO PIECES MARKED (5) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "U" ON PAGE 2. SEE SPECIAL NOTE 12 ON PAGE 5.

(7) DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 30. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 13 ON PAGE 5.

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

(SPECIAL NOTES CONTINUED)

11. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 35 FOR GUIDANCE.

12. IF IT IS DESIRED TO USE 4" X 4" STRUTS IN LIEU OF THE DOUBLED 2" X 6" STRUTS SPECIFIED, IT WILL BE NECESSARY TO USE SIX (6) STRUTS FOR EACH ROW/LAYER IN LIEU OF THE FOUR SHOWN. THE PHANTOM-LINED ADDITIONAL HORIZONTAL PIECES AND STRUT LEDGERS SHOWN ON THE "CENTER GATE A" DETAIL ON PAGE 31 WILL BE REQUIRED IN ORDER TO ACCOMMODATE THE ADDED STRUTS. THE 4" X 4" STRUTS MAY BE BEVELED FOR INSTALLATION. SEE THE "BEVEL CUT" DETAIL ON PAGE 36 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.

13. 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 PIECES MARKED (7) IN THE LOAD ON PAGE 4, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 39 AND 40 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. REFER TO PIECES MARKED (4), (5), (6), (7), AND (8) ON PAGE 8 FOR GUIDANCE. TWO (2) DOORWAY PROTECTION 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) 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. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

14. 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. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 14 THRU 28 FOR GUIDANCE.

15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 12 AND 13 FOR SHIPPING GUIDANCE.

16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 29 FOR GUIDANCE.

17. A 50'-6" LONG CAR TO BE USED FOR A 48-UNIT LOAD, PLACED IN ACCORDANCE WITH THE DEPICTED LOADING PATTERN, MUST HAVE A LOAD LIMIT OF AT LEAST 115,800 POUNDS. IF A CAR HAVING THAT LARGE A LOAD LIMIT IS NOT AVAILABLE, THE LOAD SHOULD BE FORMED WITH SIX (6) LOAD UNITS IN EACH END. A 60'-8" LONG CAR FOR THE SHIPMENT OF A 60-UNIT LOAD, WITH 8 LOAD UNITS IN ONE END AND 7 IN THE OPPOSITE, MUST HAVE A LOAD LIMIT OF AT LEAST 143,400 POUNDS.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. A MAXIMUM OF SIXTY (60) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 140,640 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES. NOTE THAT SIX (6) STRUTS PER ROW/LAYER WILL BE REQUIRED IN A 60'-8" LONG CAR. FORTY (40) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 93,760 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.

3. IF DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 8 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (7), 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 4, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GATE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 50'-6" OR 40'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IF A 60'-8" CAR IS USED.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (3), SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED (4). IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED, FOR ONE OR TWO-LAYER LOADS; SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 32 FOR CONSTRUCTION GUIDANCE.

8. WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE SEPARATOR GATES ADJACENT TO THE NAILED BLOCKING MUST BE MODIFIED. SEE THE DETAILS FOR 2-HIGH AND 1-HIGH MODIFIED SEPARATOR GATES, "SEPARATOR GATE C" AND "SEPARATOR GATE D" ON PAGE 33. THE USE OF MODIFIED SEPARATOR GATES WILL ALLOW THE SEPARATOR GATES TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.

9. 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 38 FOR GUIDANCE.

10. 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 (5) IN THE LOAD ON PAGE 4, INSTALL TWO (2) "CENTER GATES B" AS SHOWN ON PAGE 31. 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 38.

(CONTINUED AT LEFT)

BILL OF MATERIAL

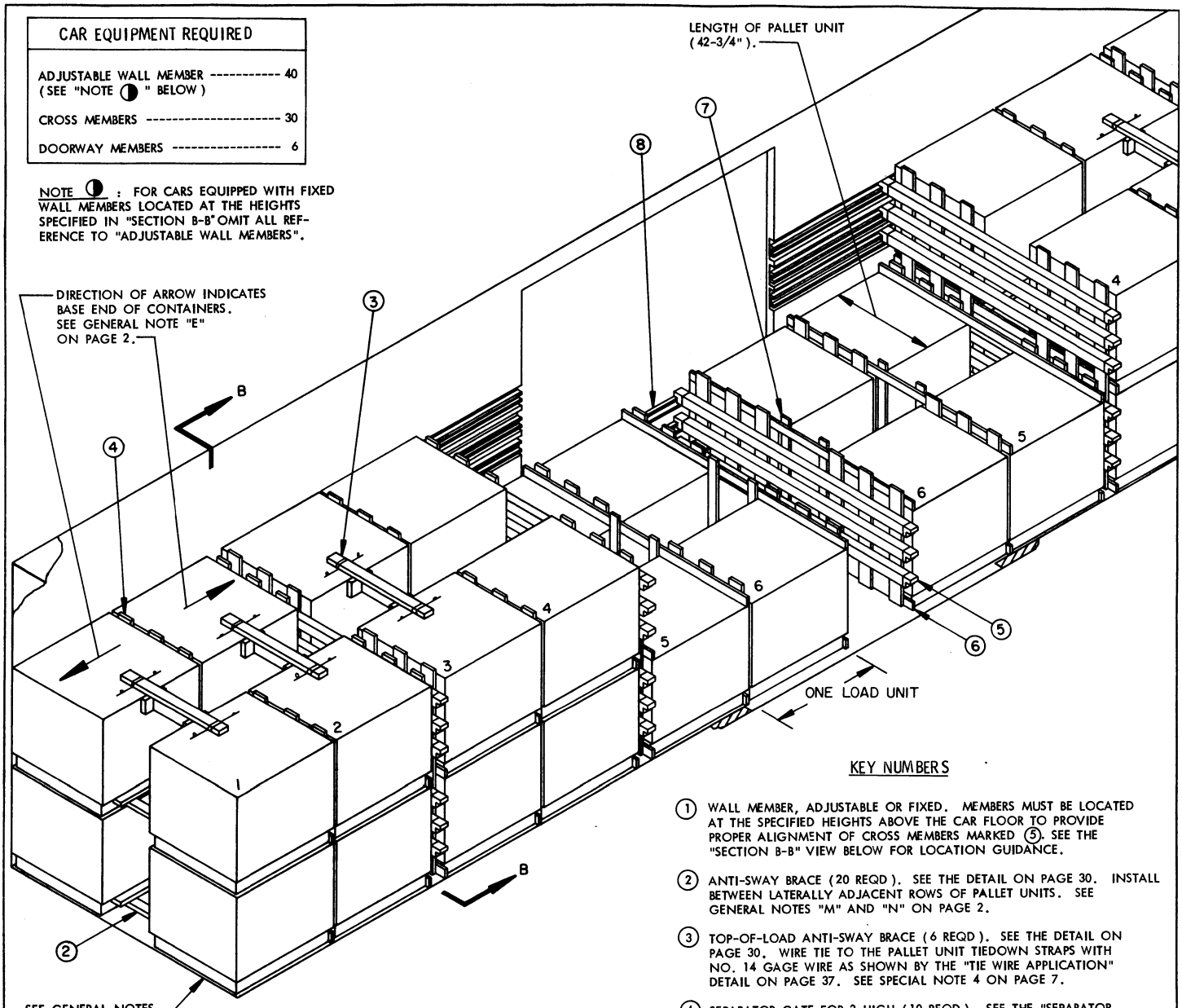
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	192	64
1" X 6"	500	250
2" X 2"	68	23
2" X 3"	26	13
2" X 4"	328	219
2" X 6"	279	279
NAILS	**NO. REQD**	**POUNDS**
6d (2")	420	2-1/2
10d (3")	600	9-1/4
12d (3-1/4")	108	2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE ---------- 48' REQD ---------- 1 LB		

LOAD AS SHOWN

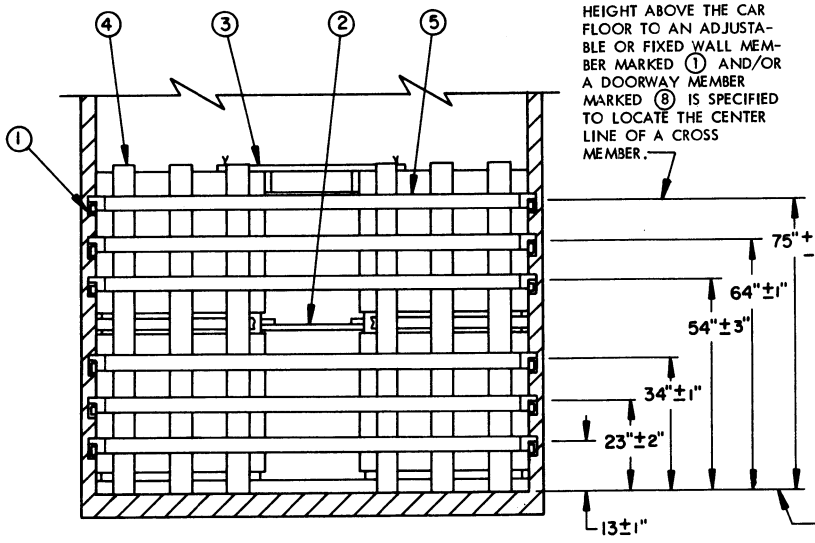
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	112,512 LBS
DUNNAGE		1,713 LBS
TOTAL WEIGHT		114,225 LBS

CAR EQUIPMENT REQUIRED	
ADJUSTABLE WALL MEMBER (SEE "NOTE ◑ " BELOW)	40
CROSS MEMBERS	30
DOORWAY MEMBERS	6

NOTE ◑ : FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION B-B" OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



ISOMETRIC VIEW



SECTION B-B

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 B-B" VIEW BELOW FOR LOCATION GUIDANCE.

(2) ANTI-SWAY BRACE (20 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 7.

(4) SEPARATOR GATE FOR 2-HIGH (10 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 7.

(5) CROSS MEMBER (30 REQD). SEE GENERAL NOTE "X" ON PAGE 3.

(6) SEPARATOR GATE FOR 1-HIGH (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 7.

(7) STOP PIECE, 1" X 4" X 48" (8 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED (6), WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 7.

(8) DOORWAY MEMBER (6 REQD). SEE THE "SECTION B-B" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 7.

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

SMCAC FORM 6-1, 1 NOV 87

SUPERSEDES SMCAC FORM 6, 1 NOV 85

PROJECT CA 225/7-85

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 WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.

2. A MAXIMUM OF THIRTY (30) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 70,320 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR.

3. 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 "G" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED (4), MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE PALLET UNIT TIEDOWN STRAPS AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL THEN POSITION A SEPARATOR GATE SHOWN AS PIECE MARKED (4), SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECES MARKED (3). IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE A" OR "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 32, AS APPLICABLE, FOR CONSTRUCTION GUIDANCE.

8. 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.

9. 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 10 AND 11 FOR GUIDANCE.

10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 29 FOR GUIDANCE.

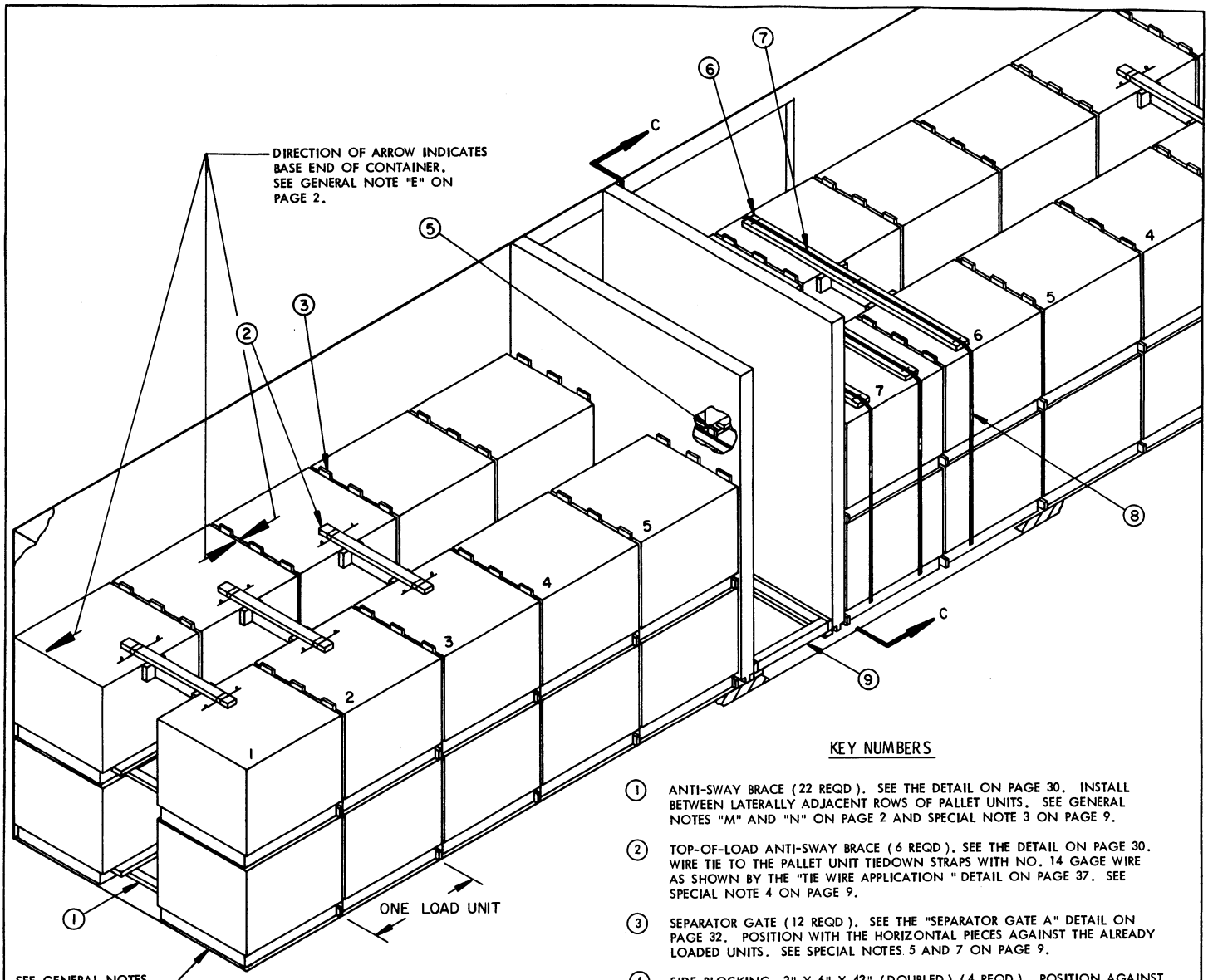
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	320	107
1" X 6"	672	336
2" X 4"	265	177
2" X 6"	18	18
NAILS	**NO. REQD**	**POUNDS**
6d (2")	624	3-3/4
10d (3")	240	3-3/4
12d (3-1/4")	84	1-1/2
WIRE, NO. 14 GAGE ---------- 48' REQD ---------- 1 LB		

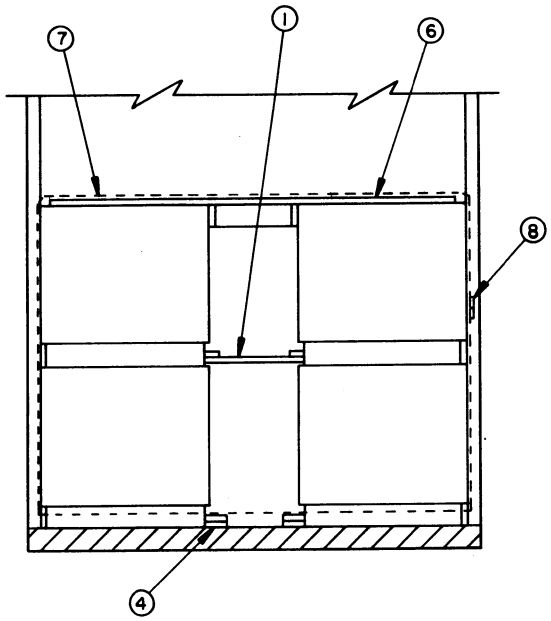
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	40	93,760 LBS
DUNNAGE		1,286 LBS
TOTAL WEIGHT		95,046 LBS

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



ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

(1) ANTI-SWAY BRACE (22 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 9.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION " DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 9.

(3) SEPARATOR GATE (12 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS. SEE SPECIAL NOTES 5 AND 7 ON PAGE 9.

(4) SIDE BLOCKING, 2" X 6" X 42" (DOUBLED) (4 REQD). POSITION AGAINST PALLETS IN THE DOORWAY AREA AS SHOWN IN THE "SECTION C-C" VIEW BELOW. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. OMIT ANTI-SWAY BRACES AT FLOOR LEVEL. SEE SPECIAL NOTE 3 ON PAGE 9.

(5) STOP PIECE, 1" X 4" X 48" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED (3), WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 9.

(6) SPACER ASSEMBLY (3 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 30.

(7) DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 33'-0" LONG STEEL STRAPPING (3 REQD). ENCIRCLE THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN IN THE ISOMETRIC VIEW. STAPLE STRAP TO PIECE MARKED (6) W/3 STAPLES. SEE SPECIAL NOTE 8 ON PAGE 9.

(8) SEAL FOR 1-1/4" STEEL STRAPPING (6 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.

(9) STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 41. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 9 ON PAGE 9.

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

(SPECIAL NOTES CONTINUED)

8. 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 PIECES MARKED (7) IN THE LOAD ON PAGE 4, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 39 AND 40 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. TWO (2) STRAPS ARE REQUIRED FOR EACH LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF THE CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE LOAD UNIT WIDTH. NOTE THAT NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

9. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED (9) IN THE LOAD ON PAGE 8, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY WILL BE REQUIRED IF ONE END OF THE LOAD CONTAINS MORE THAN FIVE (5) LOAD UNITS.

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 14 THRU 28 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.

11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 12 AND 13 FOR SHIPPING GUIDANCE.

12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 29 FOR GUIDANCE.

13. A 50'-6" LONG CAR TO BE USED FOR A 48-UNIT LOAD, PLACED IN ACCORDANCE WITH THE DEPICTED LOADING PATTERN, MUST HAVE A LOAD LIMIT OF AT LEAST 115,900 POUNDS. IF A CAR HAVING THAT LARGE A LOAD LIMIT IS NOT AVAILABLE, THE LOAD SHOULD BE FORMED WITH SIX (6) LOAD UNITS IN EACH END. A 60'-8" LONG CAR FOR THE SHIPMENT OF A 60-UNIT LOAD, WITH 8 LOAD UNITS IN ONE END AND 7 IN THE OPPOSITE, MUST HAVE A LOAD LIMIT OF AT LEAST 143,400 POUNDS.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.

2. A MAXIMUM OF SIXTY (60) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 140,640 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY (40) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 93,760 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.

3. IF THE WOODEN GATE TYPE DOORWAY PROTECTION, PIECE MARKED (7) ON PAGE 4, IS USED IN LIEU OF THE NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAP PROCEDURES, THE LOWER ANTI-SWAY BRACES IN THE DOORWAY AREA MUST BE USED.

4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A 50'-6" OR 40'-6" LONG CAR, FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.

5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL. THEN POSITION A SEPARATOR GATE, SHOWN AS PIECE MARKED (3), SO THE 1" X 4" TIE PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.

6. SEPARATOR GATES IN THE DOORWAY AREA OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF STOP PIECES, PIECES MARKED (5). IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO SIX SEPARATOR GATES.

7. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 32 FOR CONSTRUCTION GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	236	79
1" X 6"	504	252
1" X 8"	17	12
2" X 4"	333	222
2" X 6"	84	84
4" X 4"	12	16

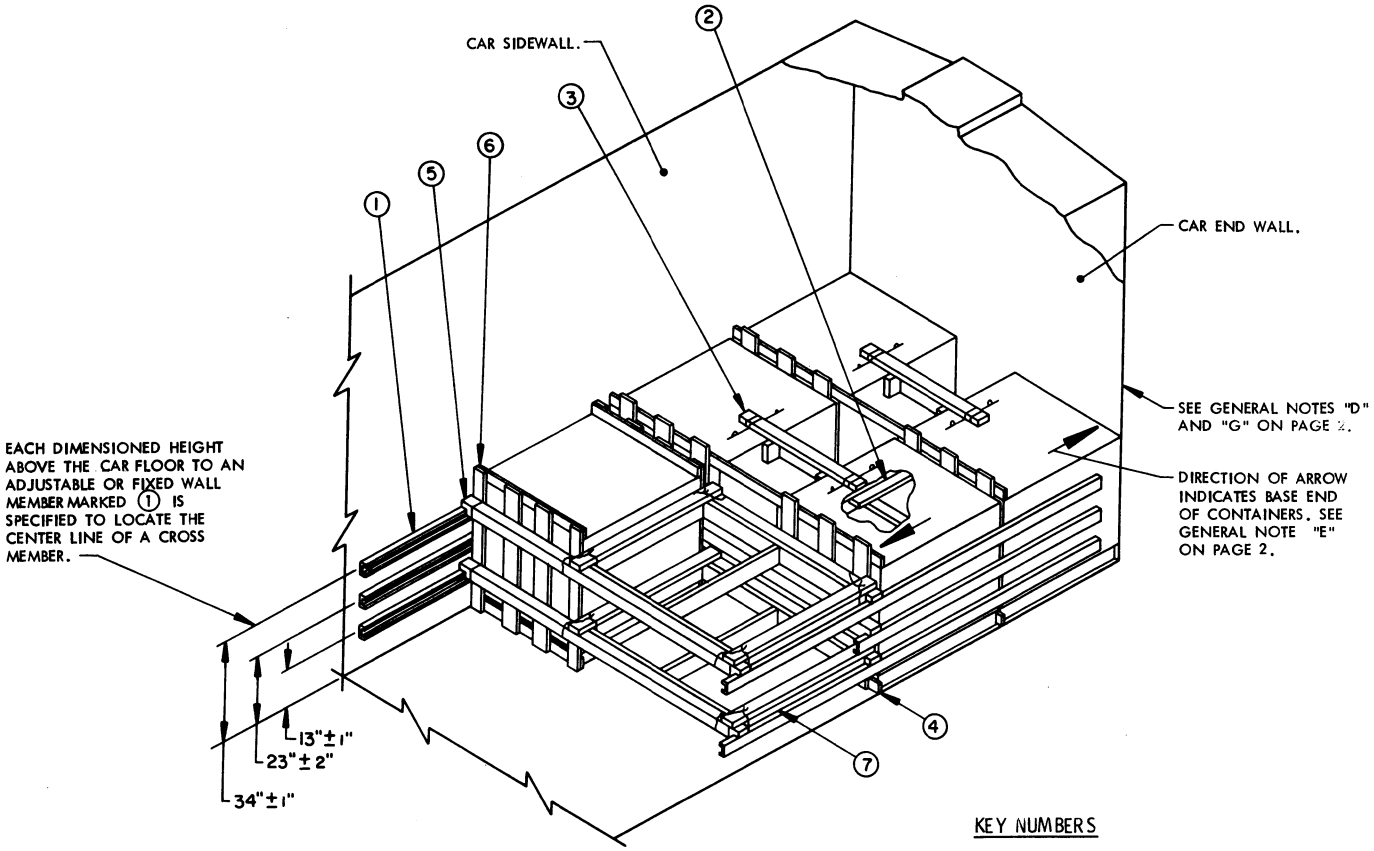
NAILS	NO. REQD	POUNDS
6d (2")	472	3
10d (3")	282	4-1/2
12d (3-1/4")	142	2-1/2
16d (3-1/2")	40	1

STEEL STRAPPING, 1-1/4" X .031" OR .035"	99' REQD	15 LBS
SEAL FOR 1-1/4" STRAPPING	6 REQD	NIL
WIRE, NO. 14 GAGE	48' REQD	3/4 LBS
STAPLE, STRAP	9 REQD	NIL

LOAD AS SHOWN

ITEMS	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	112,512 LBS
DUNNAGE		1,357 LBS
TOTAL WEIGHT		113,869 LBS

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



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 EACH END OF THE CAR AND WIRE TIED TO PALLET UNIT TIEDOWN STRAPS WITH NO. 14 GAGE WIRE. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
4. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. CONSTRUCT EACH GATE TO BE CAR WIDTH MINUS 1/2" IN LENGTH BY UNIT HEIGHT, OR UNIT LENGTH IN WIDTH BY UNIT HEIGHT, AS APPLICABLE.
5. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED (7), 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 A SECOND 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 DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(3) TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAPS AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 3.

(4) SEPARATOR GATE FOR 1-HIGH BY 2-WIDE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. POSITION AS SHOWN WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTE 4.

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

(6) SEPARATOR GATE FOR 1-HIGH BY 1-WIDE (2 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27.

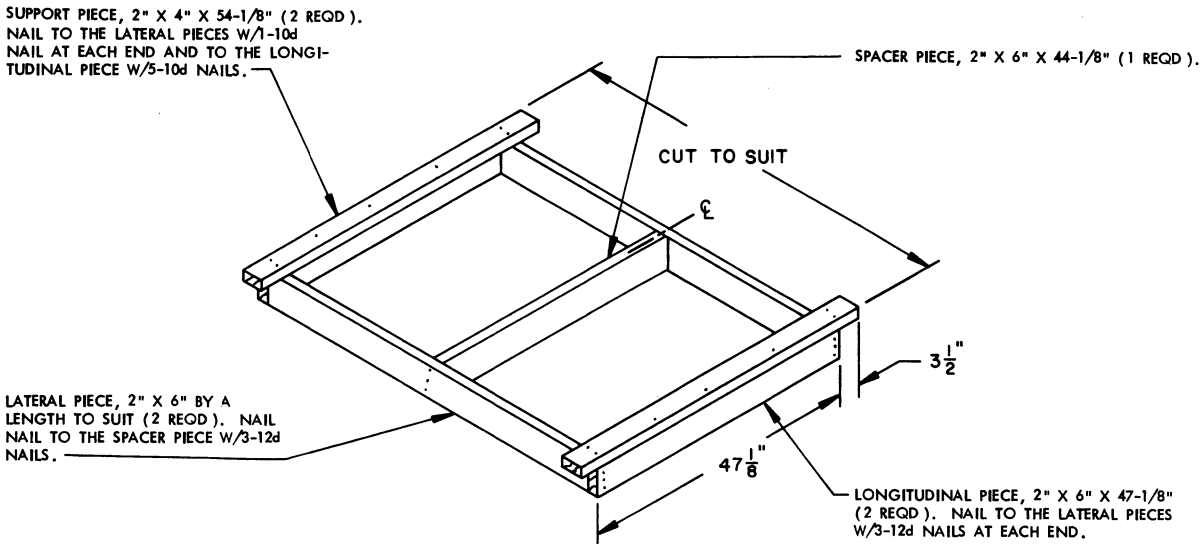
(7) SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 11 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

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

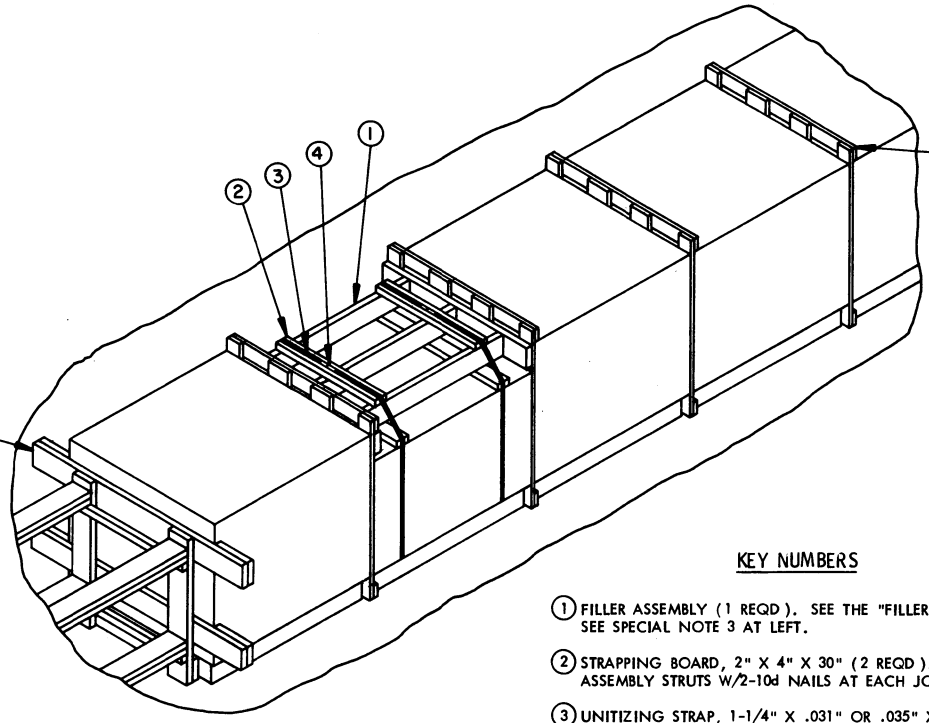
SMCAC FORM 6-1, 1 NOV 87

PROJECT CA 225/7-85

SUPERSEDES SMCAC FORM 6, 1 NOV 84



SPACER ASSEMBLY A



POSITIONING OF A PARTIAL UNIT WITHIN A LAYER

KEY NUMBERS

(1) FILLER ASSEMBLY (1 REQD). SEE THE "FILLER ASSEMBLY A" DETAIL BELOW. SEE SPECIAL NOTE 3 AT LEFT.

(2) STRAPPING BOARD, 2" X 4" X 30" (2 REQD). NAIL TO THE FILLER ASSEMBLY STRUTS W/2-10d NAILS AT EACH JOINT.

(3) UNITIZING STRAP, 1-1/4" X .031" OR .035" X 20'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION.

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

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 LOAD.

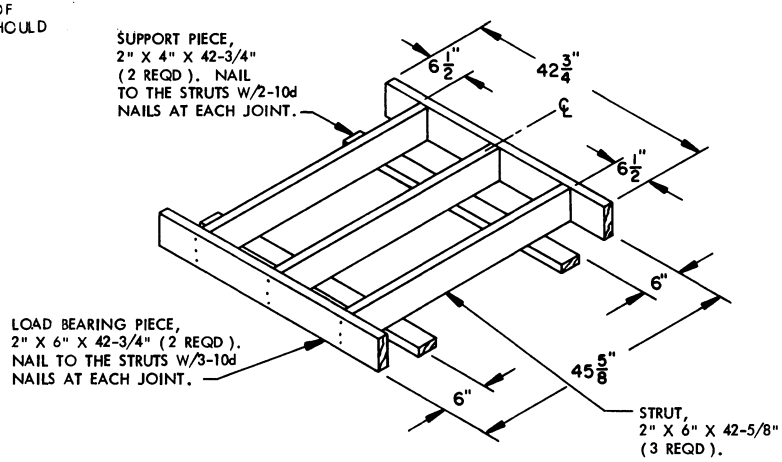
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CONTAINERS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN THREE (3) LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 4-LAYER UNIT WITHIN A LOAD. REFER TO PAGE 13 FOR SHIPPING PROCEDURES FOR A 3-LAYER UNIT WITHIN A LOAD.

3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/ 6A-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.

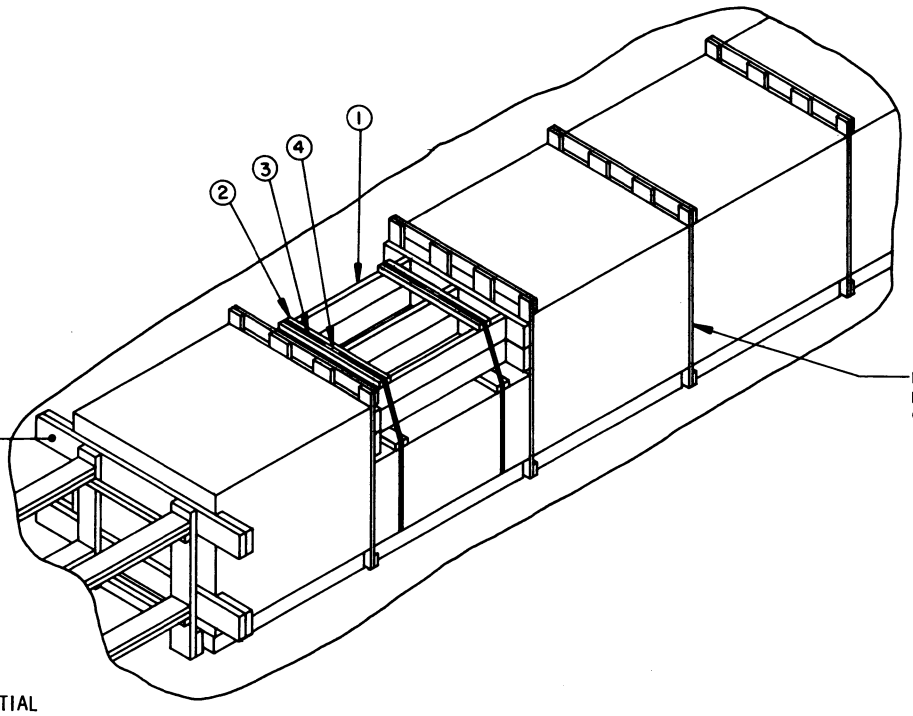
5. THE "POSITIONING OF A PARTIAL UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

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.



FILLER ASSEMBLY A

PROCEDURES FOR SHIPMENT OF A FOUR-LAYER PARTIAL UNIT



POSITIONING OF A PARTIAL 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 LOAD.

2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CONTAINERS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN THREE (3) LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A LOAD. REFER TO PAGE 12 FOR A 4-LAYER UNIT WITHIN A LOAD.

3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/ 6A-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 LENGTHWISE 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.

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.

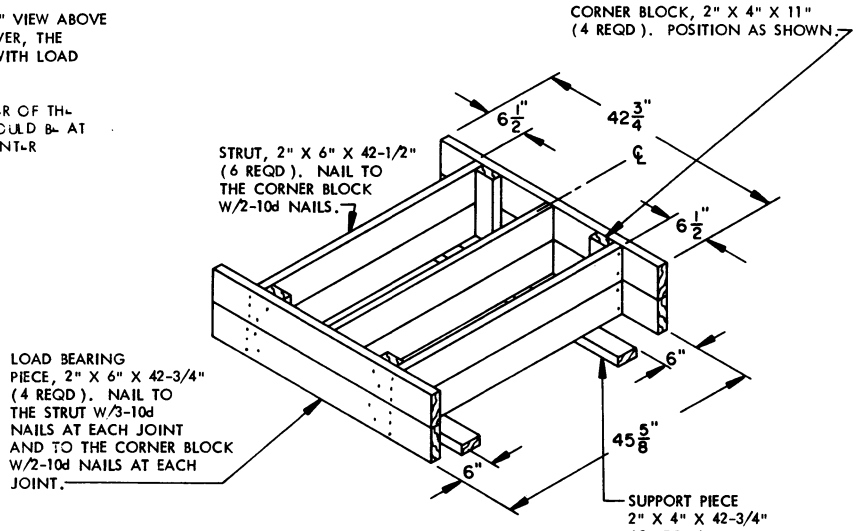
KEY NUMBERS

(1) FILLER ASSEMBLY (1 REQD). SEE THE "FILLER ASSEMBLY B" DETAIL BELOW.

(2) STRAPPING BOARD, 2" X 4" X 30" (2 REQD). POSITION ON TOP OF THE FILLER ASSEMBLY, PIECE MARKED (1). NAIL TO THE STRUTS W/2-10d NAILS AT EACH JOINT.

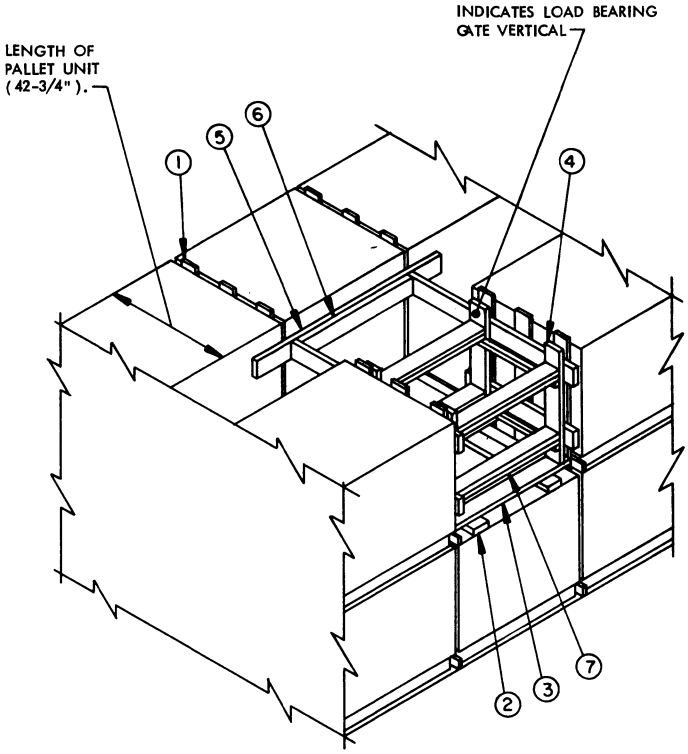
(3) UNITIZING STRAP, 1-1/4" X .031" OR .035" X 20'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION.

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



FILLER ASSEMBLY B

PROCEDURES FOR SHIPMENT OF A THREE-LAYER PARTIAL UNIT



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 2-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A PALLET UNIT FROM A 1-LAYER LOAD.
3. THE OMITTED-UNIT PROCEDURE 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.
4. 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.

KEY NUMBERS

(1) SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32.

(2) FILL PIECE, 2" X 6" X 42" (2 REQD). POSITION ON TOP OF PALLET UNIT, SIX INCHES (6") FROM THE ENDS OF THE CONTAINERS.

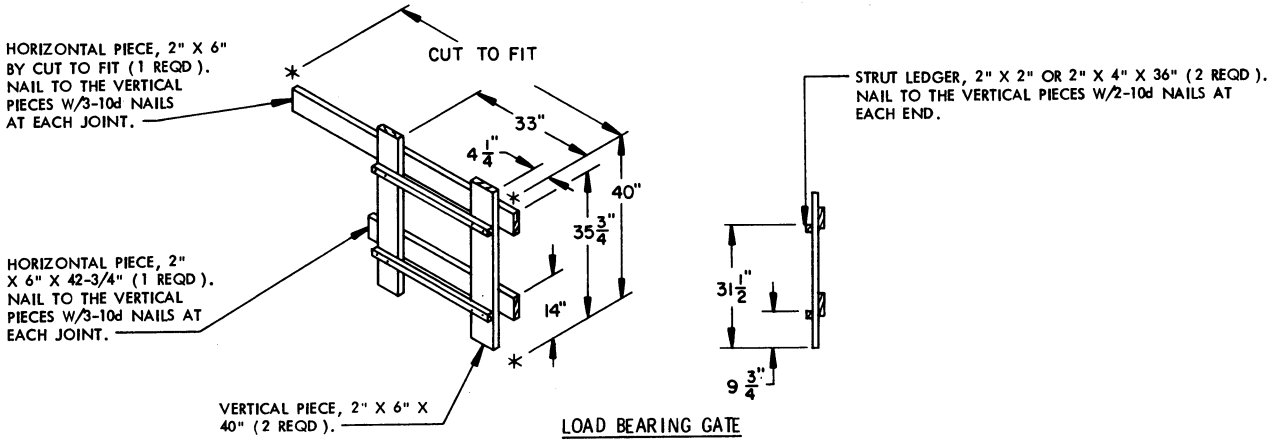
(3) SUPPORT PIECE, 2" X 6" X 45-5/8" (2 REQD). POSITION ON TOP OF THE FILL PIECE, PIECE MARKED (2), AND SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE. NAIL TO THE FILL PIECE W/3-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO NAIL INTO A CONTAINER.

(4) LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE DETAIL BELOW. POSITION AS SHOWN AND NAIL TO THE BACK-UP PIECE, PIECE MARKED (6), W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECES, PIECE MARKED (3), W/2-10d NAILS AT EACH JOINT.

(5) LONGITUDINAL PIECE, 2" X 6" X 72" (1 REQD).

(6) BACK-UP PIECE, 2" X 6" X 42-5/8" (1 REQD). NAIL TO THE LONGITUDINAL PIECE, PIECE MARKED (5), W/5-10d NAILS.

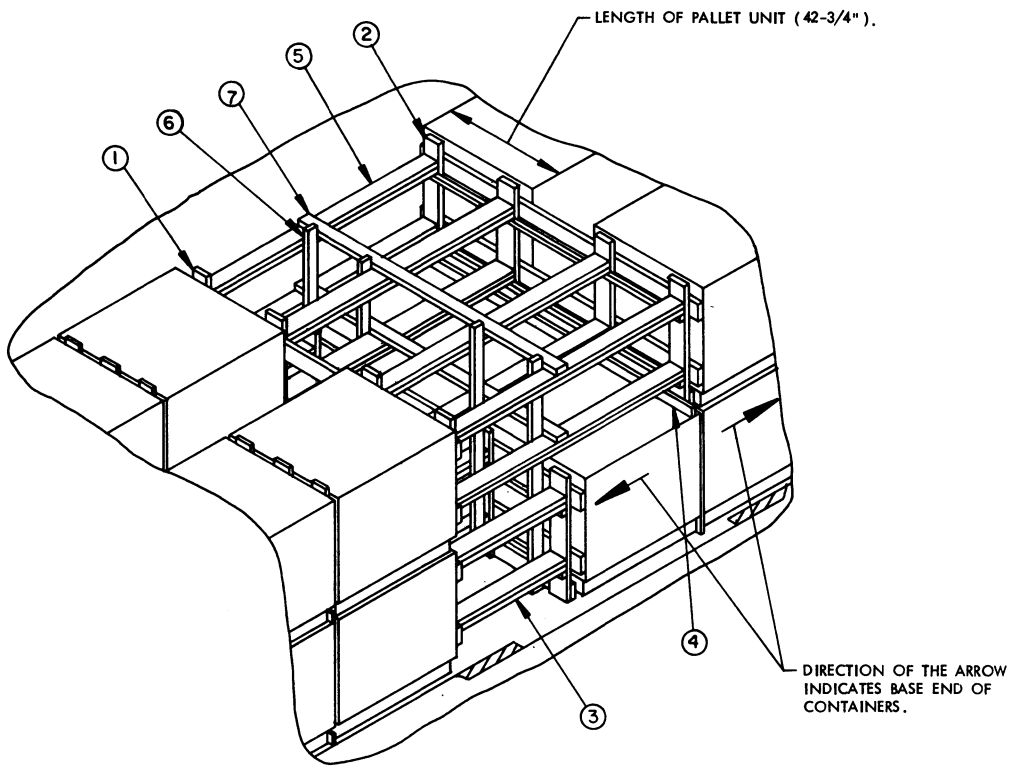
(7) STRUT, 2" X 6" X 39-5/8" (DOUBLED) (4 REQD). LAMINATE W/1-10d NAIL EVERY 6" AND TOENAIL THE TOP PIECE TO PIECES MARKED (4) W/2-16d NAILS AT EACH END.



LOAD BEARING GATE

NOTE: RIGHT HAND GATE IS SHOWN.

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



ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.

2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM ONE (1) LOAD UNIT IS SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS. IF THE STRUTS ARE OVER 8'-0" LONG, IT WILL BE NECESSARY TO ADD ANOTHER SET OF VERTICAL AND HORIZONTAL STRUT BRACING PIECES. NOTE THAT A 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH PAD MUST BE POSITIONED FLAT UNDER THE VERTICAL BRACING TO PREVENT THE VERTICAL BRACING FROM PUNCTURING A CONTAINER. SECURE BY TOENAILING EACH VERTICAL BRACING PIECE TO THE PAD W/1-10d NAIL.

3. 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.

KEY NUMBERS

(1) CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 31. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 31.

(3) STRUT, 2" X 6" BY CUT TO FIT (DOUBLED) (8 REQD). LAMINATE W/1-10d NAIL EVERY 6". POSITION BETWEEN CENTER GATES, PIECES MARKED (1) AND (2) IN THE FIRST LAYER AND TOENAIL THE TOP PIECE W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "T" AND "U" ON PAGE 2.

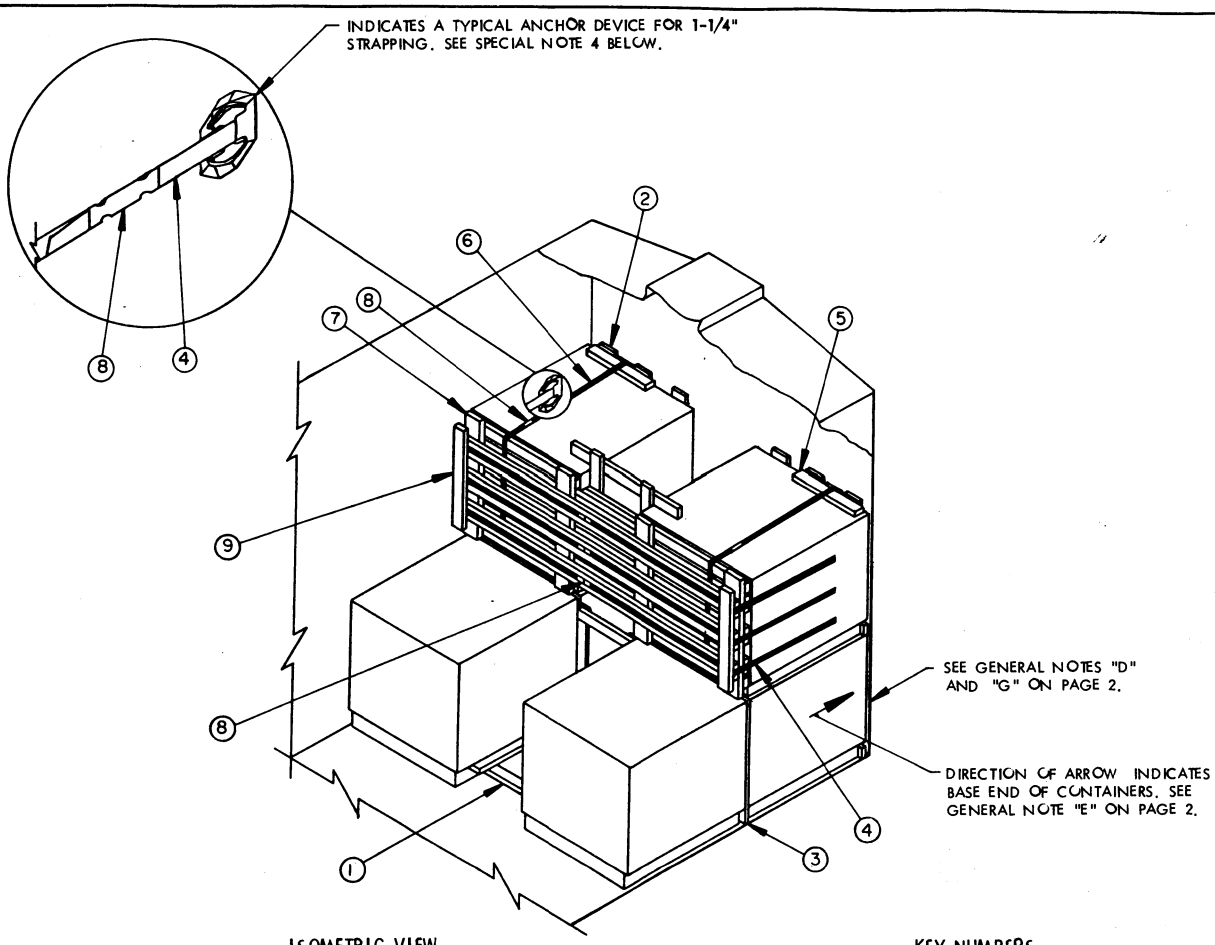
(4) SUPPORT PIECE, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (1 REQD) NAIL TO THE CENTER GATE VERTICAL PIECES OF THE TOP LAYER GATE W/3-10d NAILS AT EACH JOINT.

(5) STRUT, 2" X 6" BY CUT TO FIT (8 REQD). LAMINATE W/1-10d NAIL EVERY 6". POSITION BETWEEN THE CENTER GATES, PIECES MARKED (1) AND (2), IN THE SECOND LAYER AND TOENAIL THE TOP PIECE W/2-16d NAILS AT EACH END.

(6) VERTICAL STRUT BRACING, 2" X 4" X 6'-8" (4 REQD). NAIL TO THE STRUTS, PIECES MARKED (3) AND (5), W/3-10d NAILS AT EACH JOINT.

(7) HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 9" IN LENGTH (2 REQD). NAIL TO THE STRUTS, PIECES MARKED (5), W/3-10d NAILS AT EACH JOINT.

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



ISOMETRIC VIEW

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 PALLET UNITS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED PALLET UNITS WILL NOT BE SHPPED.

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 2 PALLET UNITS; A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN 3 PALLET 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 WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 15 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 14 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 17 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.

KEY NUMBERS

(1) ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) SEPARATOR GATE FOR 2-HIGH LOAD (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR END WALL.

(3) SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE "ALTERNATIVE SEPARATOR GATE B" DETAIL ON PAGE 32.

(4) BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 17 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 AND 4 AT LEFT.

(5) STRAPPING BOARD (2 REQD). SEE THE DETAIL ON PAGE 17.

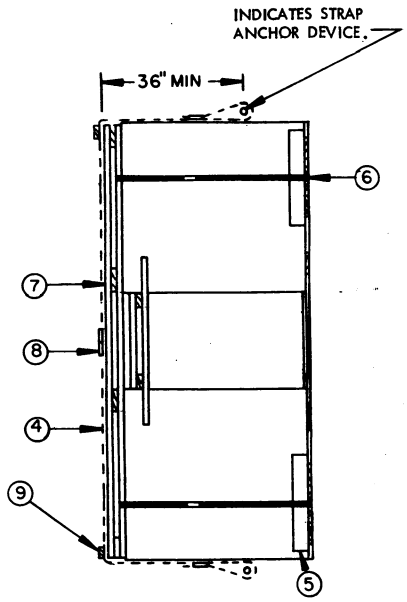
(6) BUNDLING STRAP, 1-1/4" X .031" OR .035" X 16'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED (5) . TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED (4) .

(7) BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 17. SEE SPECIAL NOTE 3 AT LEFT.

(8) SEAL FOR 1-1/4" STEEL STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED (4) , AND 1 PER BUNDLING STRAP, PIECE MARKED (6)). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.

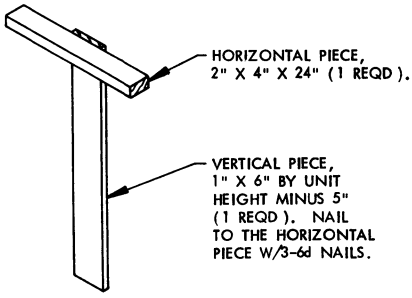
(9) STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

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

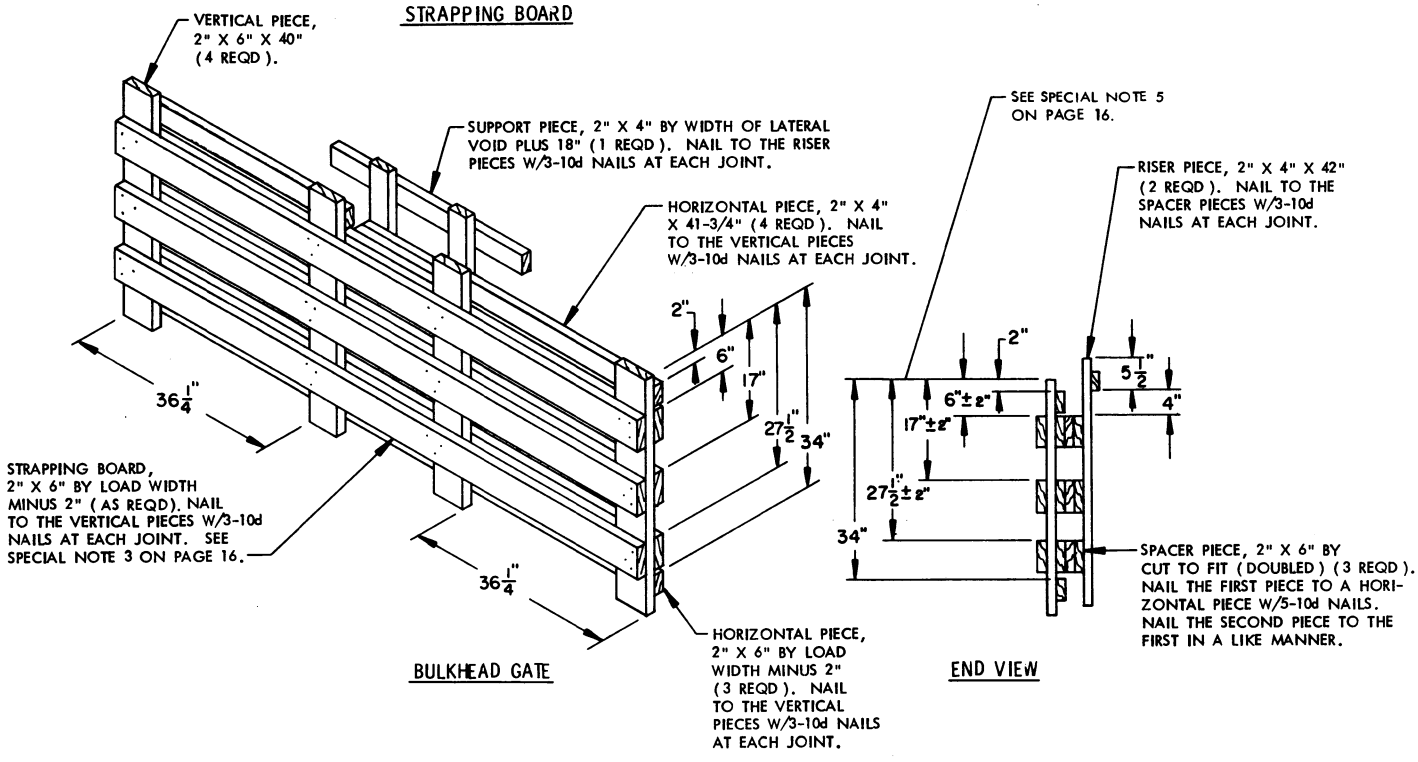


STRAP APPLICATION PLAN VIEW

THE ANTI-SWAY BRACES, PIECES MARKED ① , HAVE BEEN OMITTED FOR CLARITY.



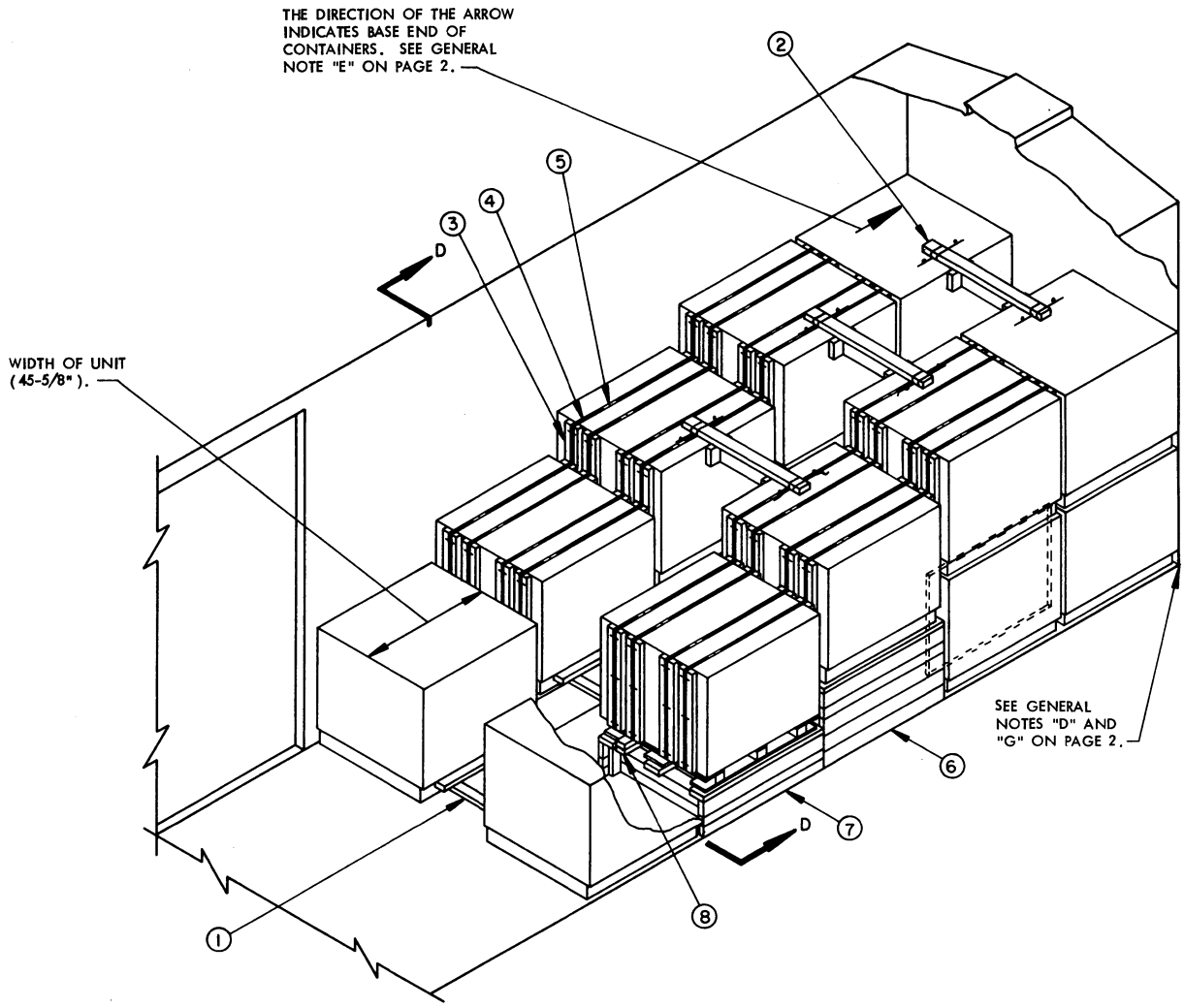
STRAPPING BOARD



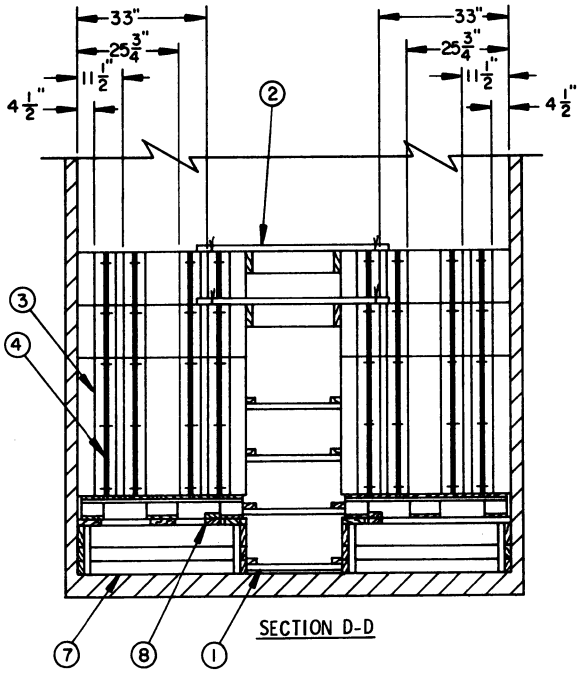
BULKHEAD GATE

END VIEW

TYPICAL LCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL LAYER BRACING



ISOMETRIC VIEW



SECTION D-D

KEY NUMBERS

(1) ANTI-SWAY BRACE (7 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37.

(3) STRAPPING BOARD, 2" X 6" X 35" (64 REQD/8 PER PALLET UNIT). POSITION AS SHOWN ABOVE AND IN THE "SECTION D-D" VIEW AT LEFT.

(4) REINFORCING STRAP, 1-1/4" X .035" X 16'-0" LONG (REF) STEEL STRAPPING (32 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO A STRAPPING BOARD W/3 STAPLES.

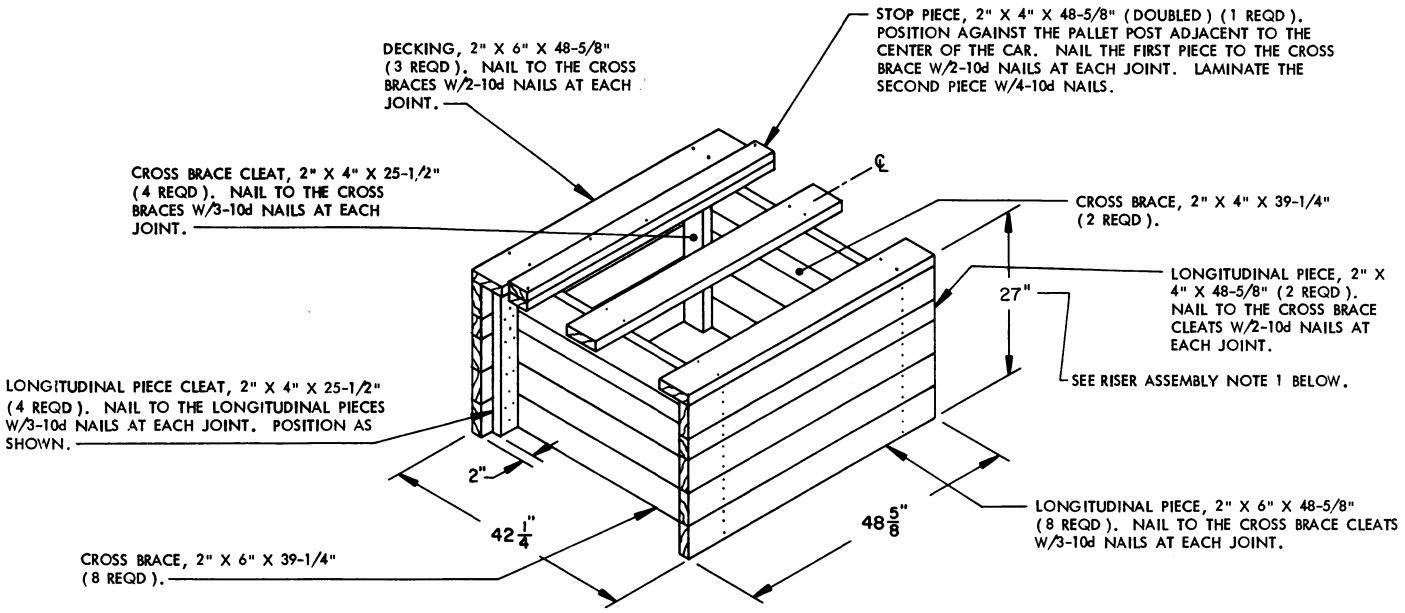
(5) SEAL FOR 1-1/4" STRAPPING (64 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.

(6) RISER ASSEMBLY (2 REQD). SEE THE "RISER ASSEMBLY A" DETAIL ON PAGE 19.

(7) RISER ASSEMBLY (2 REQD). SEE THE "RISER ASSEMBLY B" DETAIL ON PAGE 19.

(8) STOP PIECE (4 REQD). SEE THE "RISER ASSEMBLY" DETAILS ON PAGE 19 FOR LOCATION AND NAILING GUIDANCE.

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL LAYER BRACING



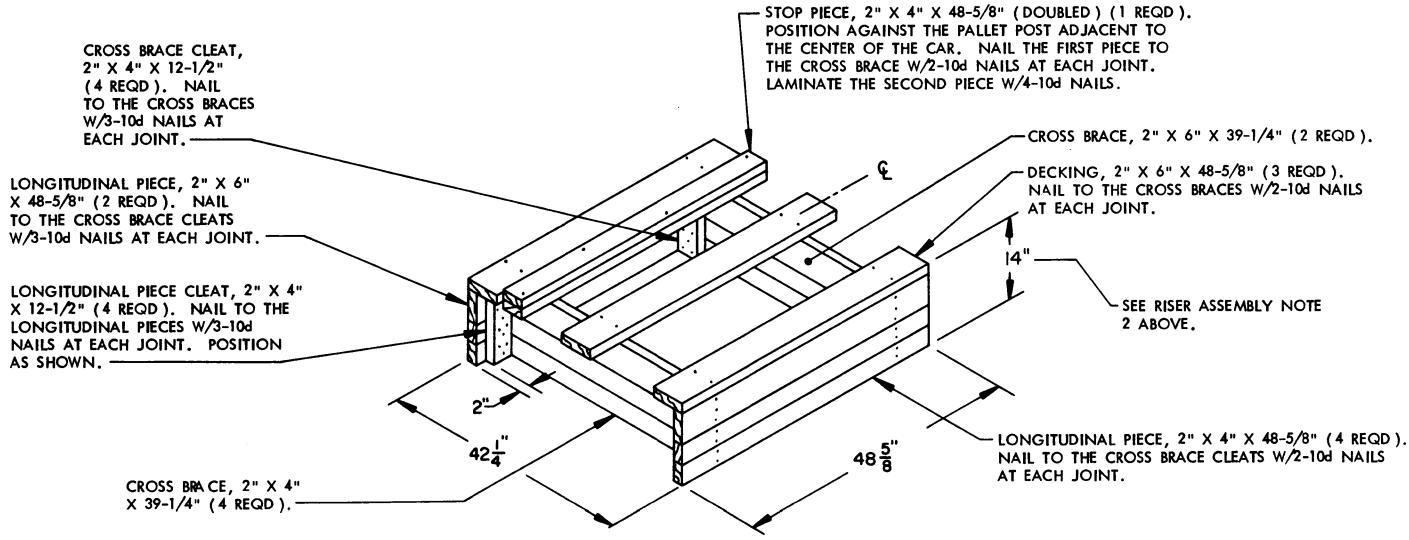
RISER ASSEMBLY A

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. 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.

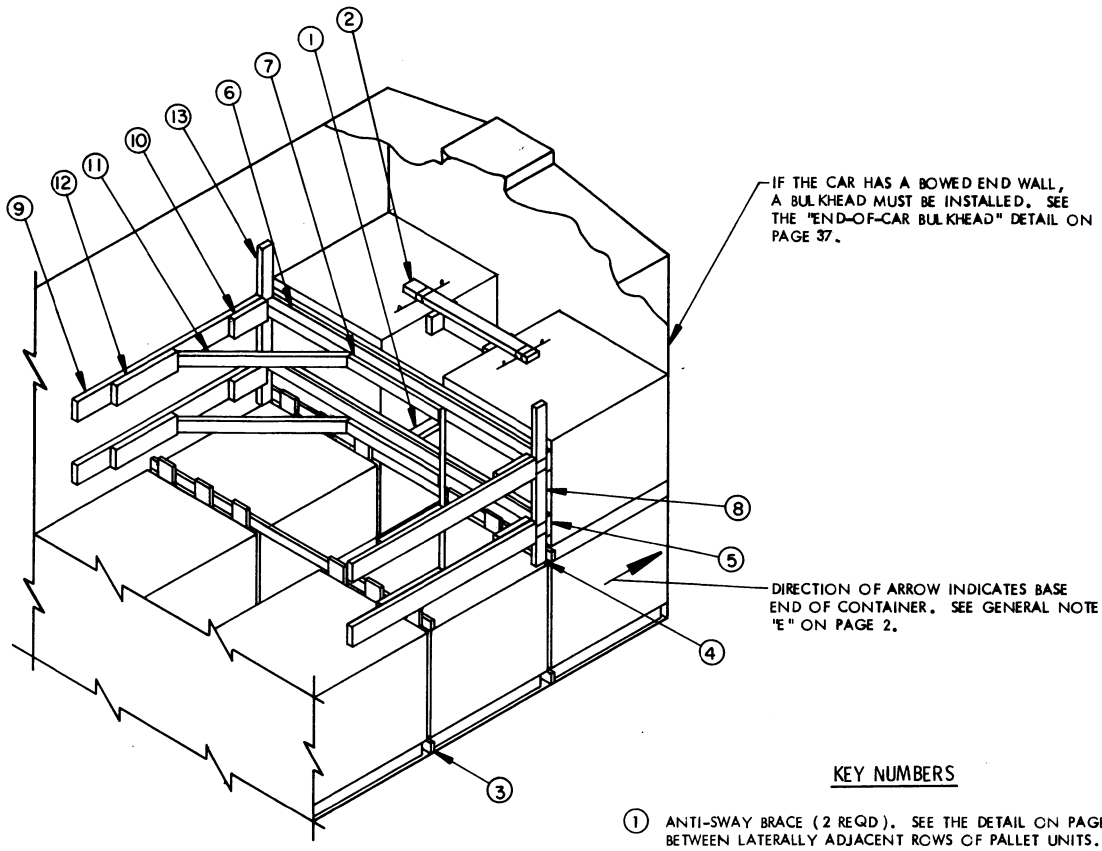
SPECIAL NOTES FOR RISER ASSEMBLY:

1. A TWO-THIRDS HEIGHT RISER IS SHOWN AS RISER ASSEMBLY "A" AND AS PIECE MARKED (6) IN THE LOAD ON PAGE 18. THE RISER IS CONSTRUCTED TO BE 27" IN HEIGHT AFTER THE DECKING IS IN PLACE. NOTE: A PLUS OR MINUS 1" TOLERANCE FROM 27-1/2" IS PERMISSIBLE.
2. A ONE-THIRD HEIGHT RISER IS SHOWN AS RISER ASSEMBLY "B" AND AS PIECE MARKED (7) IN THE LOAD ON PAGE 18. THE RISER IS CONSTRUCTED TO BE 14" IN HEIGHT AFTER THE DECKING IS IN PLACE. NOTE: A PLUS OR MINUS 1" TOLERANCE FROM 13-3/4" IS PERMISSIBLE.



RISER ASSEMBLY B

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING



ISOMETRIC VIEW

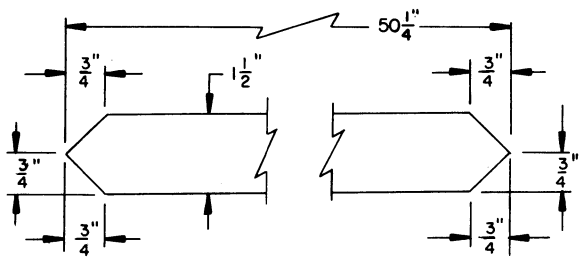
SPECIAL NOTES:

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

2. THE 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, OR TWO (2) PALLET UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 21, 22, AND 23 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

3. 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 (4), (5), (6), (8), (10), AND (13) MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED (11) TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED (9) 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 (9) 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 (9) IS DOUBLED.

4. THE CENTER CLEAT, SHOWN AS PIECE MARKED (7), 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.



DIAGONAL BRACE

KEY NUMBERS

(1) ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.

(3) SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32.

(4) SUPPORT CLEAT, 2" X 4" X 1.0" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED (5) AND (6) ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 3 AT LEFT.

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

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

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

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

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

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

(11) 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 (6), AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (9), W/2-16d NAILS AT EACH END.

(12) BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (9), W/8-16d NAILS.

(13) 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

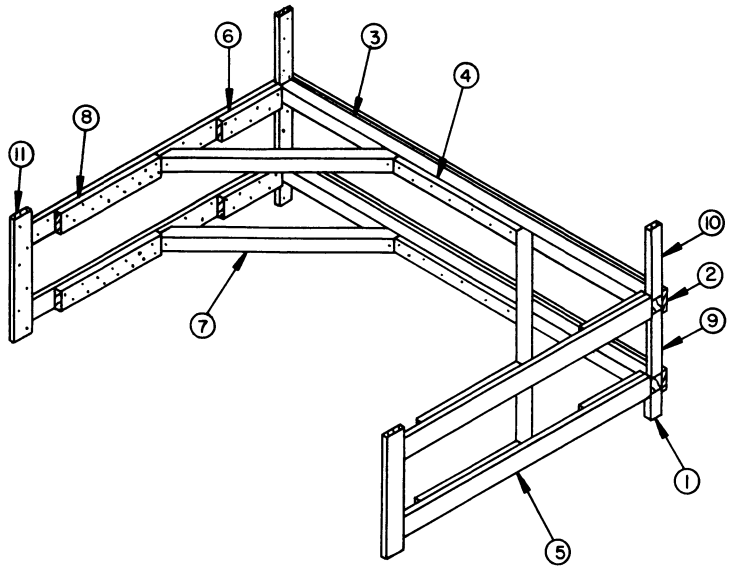
SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS OR NOT MORE THAN FOUR (4) PALLET UNITS. IF THE PARTIAL TIER TO BE BRACED IS SIX OR EIGHT PALLET UNITS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 22 MAY BE USED, OR THE TYPE "D" K-BRACE DEPICTED ON PAGE 23 MAY BE USED IF THE PARTIAL TIER IS MORE THAN EIGHT PALLET UNITS. IF THE PARTIAL TIER IS ONLY TWO PALLET UNITS, THE TYPE "A" K BRACE ON PAGE 20 IS 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), (10), AND (11) 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 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 20 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

(1) SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED (2) AND (3) ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. 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 "M" AND "N" 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.

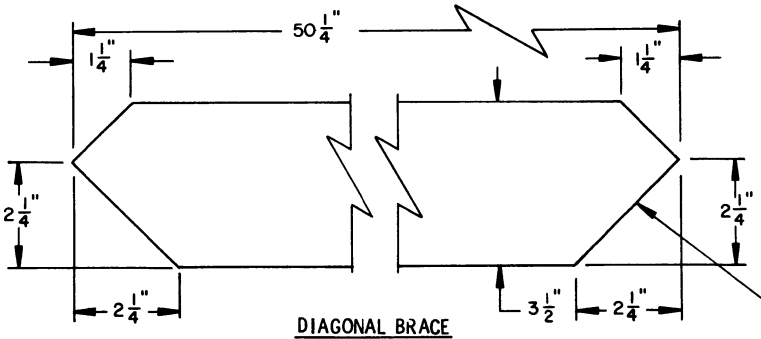
(7) DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED (3), AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (5) W/1-60d NAIL AT EACH END.

(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 18" (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.

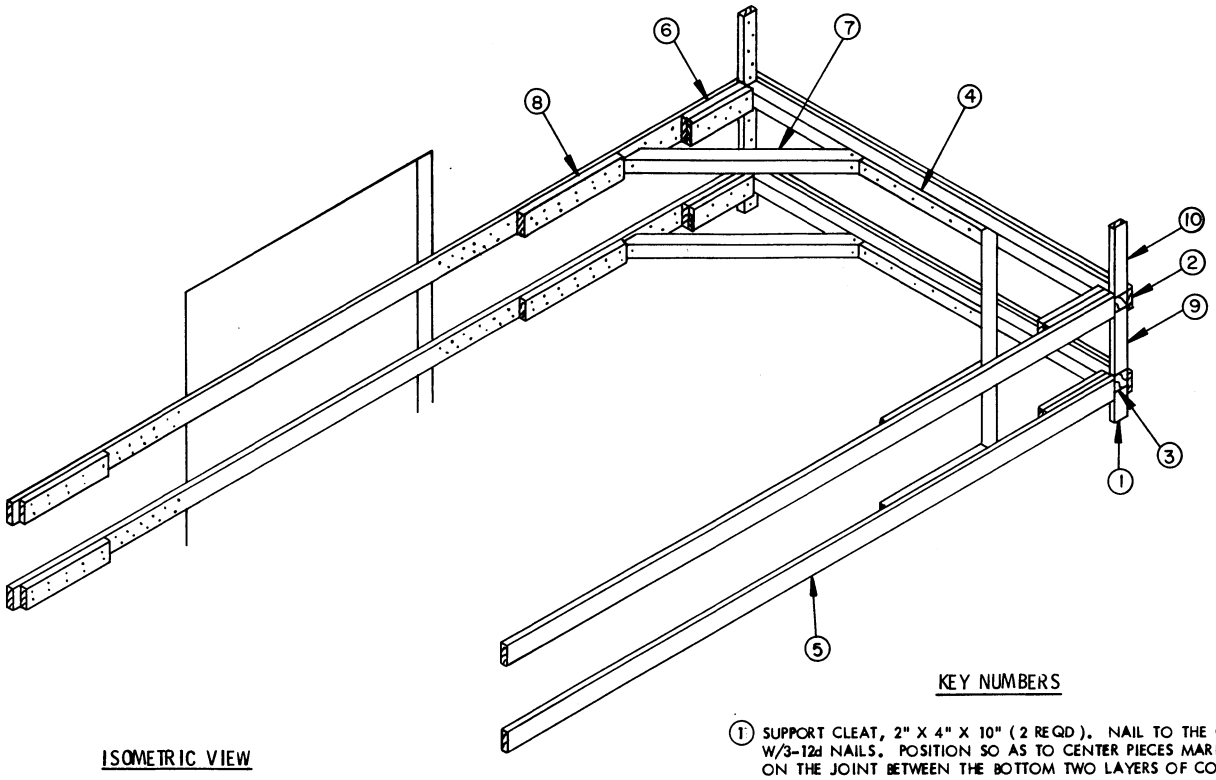
(11) VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

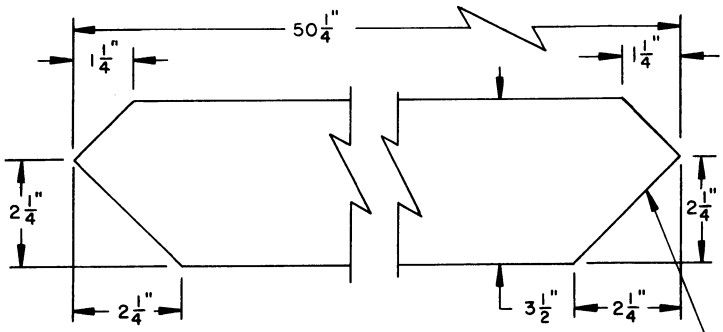
SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS OR EIGHT (8) PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN EIGHT PALLET UNITS, REFER TO THE TYPE "D" K-BRACE ON PAGE 23. IF THE PARTIAL TIER IS FOUR PALLET UNITS, THE TYPE "B" K-BRACE ON PAGE 21 MAY BE USED, OR IF THE PARTIAL TIER IS ONLY TWO PALLET UNITS, THE TYPE "A" K-BRACE ON PAGE 20 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.

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.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

KEY NUMBERS

(1) SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED (2) AND (3) ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. 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 "M" AND "N" 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 HORIZONTAL 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.

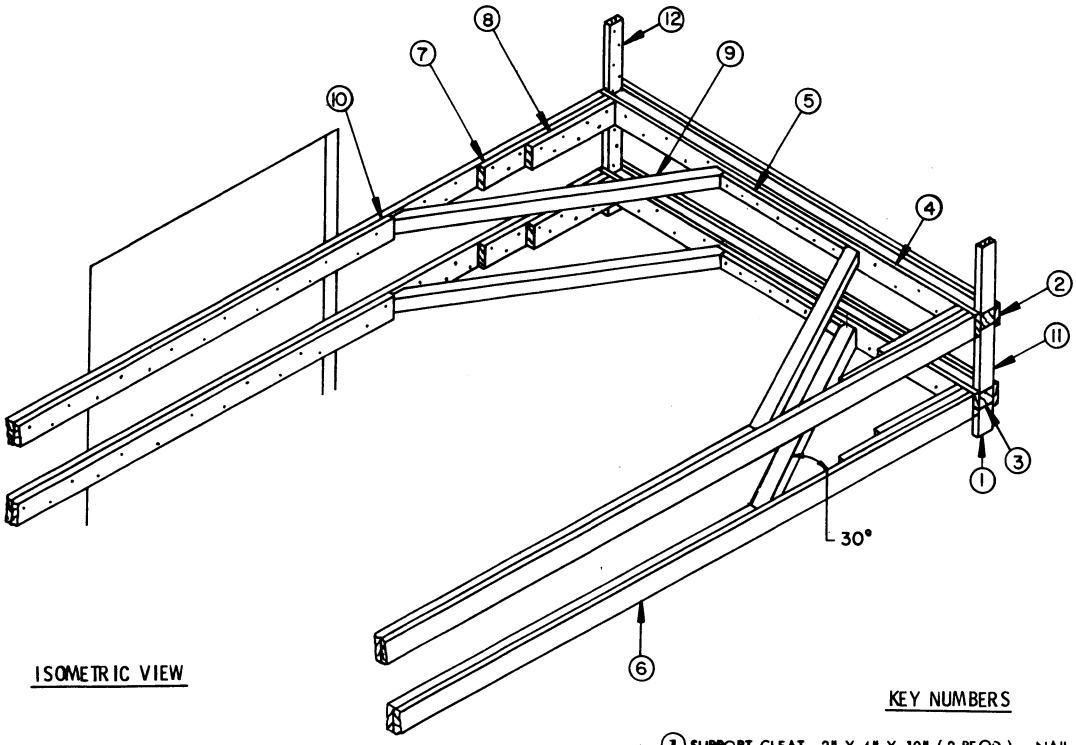
(8) BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (5), W/14-16d NAILS.

(9) SPACER CLEAT, 2" X 4" X 18" (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.

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).

TYPE "C" K-BRACE



ISOMETRIC VIEW

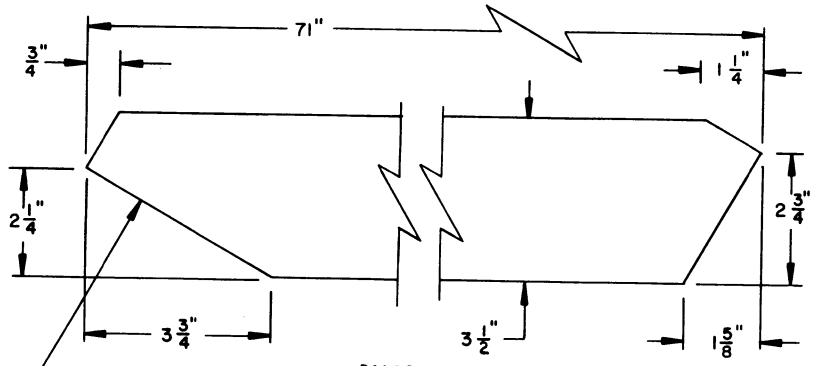
SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS OR NOT MORE THAN TEN (10) PALLET UNITS. IF THE PARTIAL TIER TO BE BRACED IS ONLY SIX OR EIGHT PALLET UNITS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 22 MAY BE USED. IF FOUR PALLET UNITS ARE TO BE SHIPPED, THE TYPE "B" K-BRACE DEPICTED ON PAGE 21 MAY BE USED. IF THE PARTIAL TIER IS ONLY TWO PALLET UNITS, THE TYPE "A" K-BRACE ON PAGE 20 IS 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.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A HORIZONTAL WALL CLEAT, PIECE MARKED (6).

KEY NUMBERS

(1) SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/3-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED (2) AND (3) ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. 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 "M" AND "N" 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.

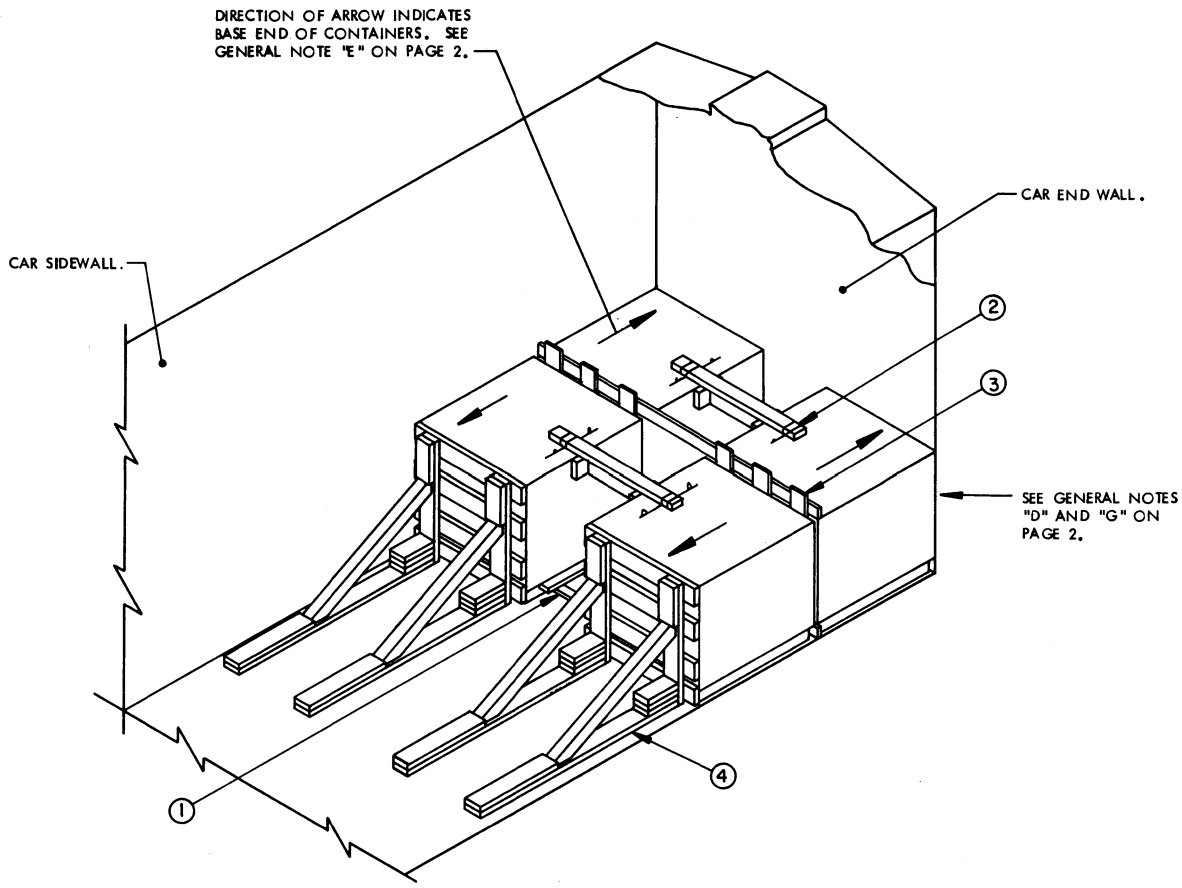
(9) DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED (4), AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (6), W/1-60d NAIL AT EACH END.

(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 18" (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.

TYPE "D" K-BRACE



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.
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 THREE (3) PALLET UNITS.

KEY NUMBERS

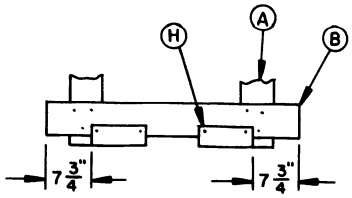
(1) ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 30. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 30. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAPS WITH NO.14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37.

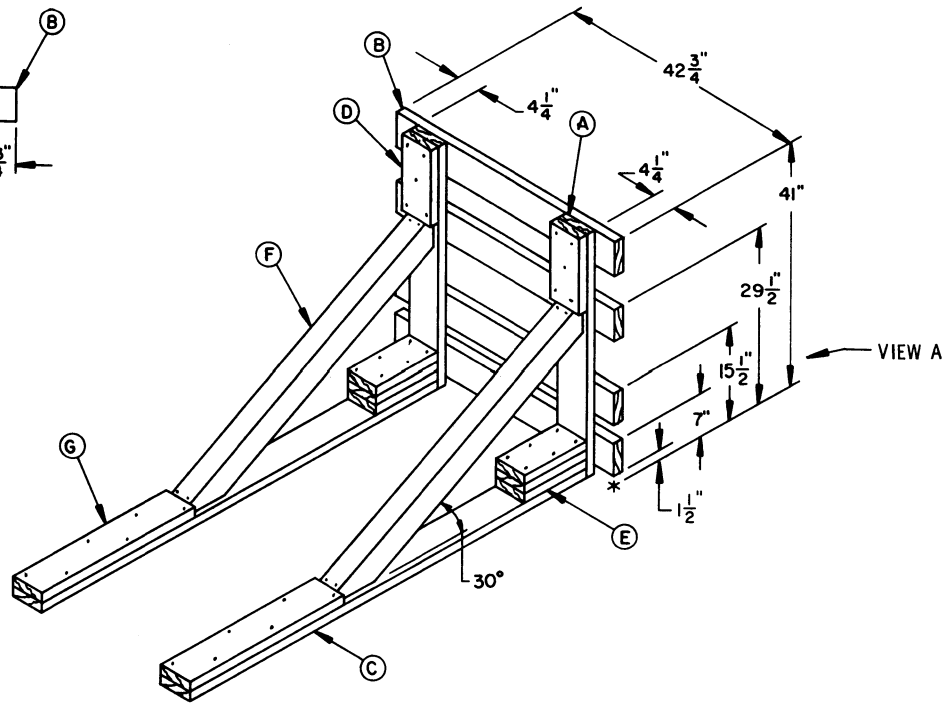
(3) SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 32. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY LOADED UNITS.

(4) KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 25.

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



VIEW A



ISOMETRIC VIEW

KEY LETTERS

(A) VERTICAL PIECE, 2" X 6" X 41" (2 REQD).

(B) HORIZONTAL PIECE, 2" X 6" X 42-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(C) FLOOR CLEAT, 2" X 6" X 6'-5" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "R" ON PAGE 2.

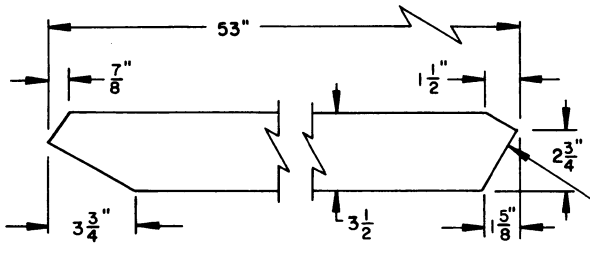
(D) HOLD-DOWN CLEAT, 2" X 6" X 13" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.

(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 51" (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 END.

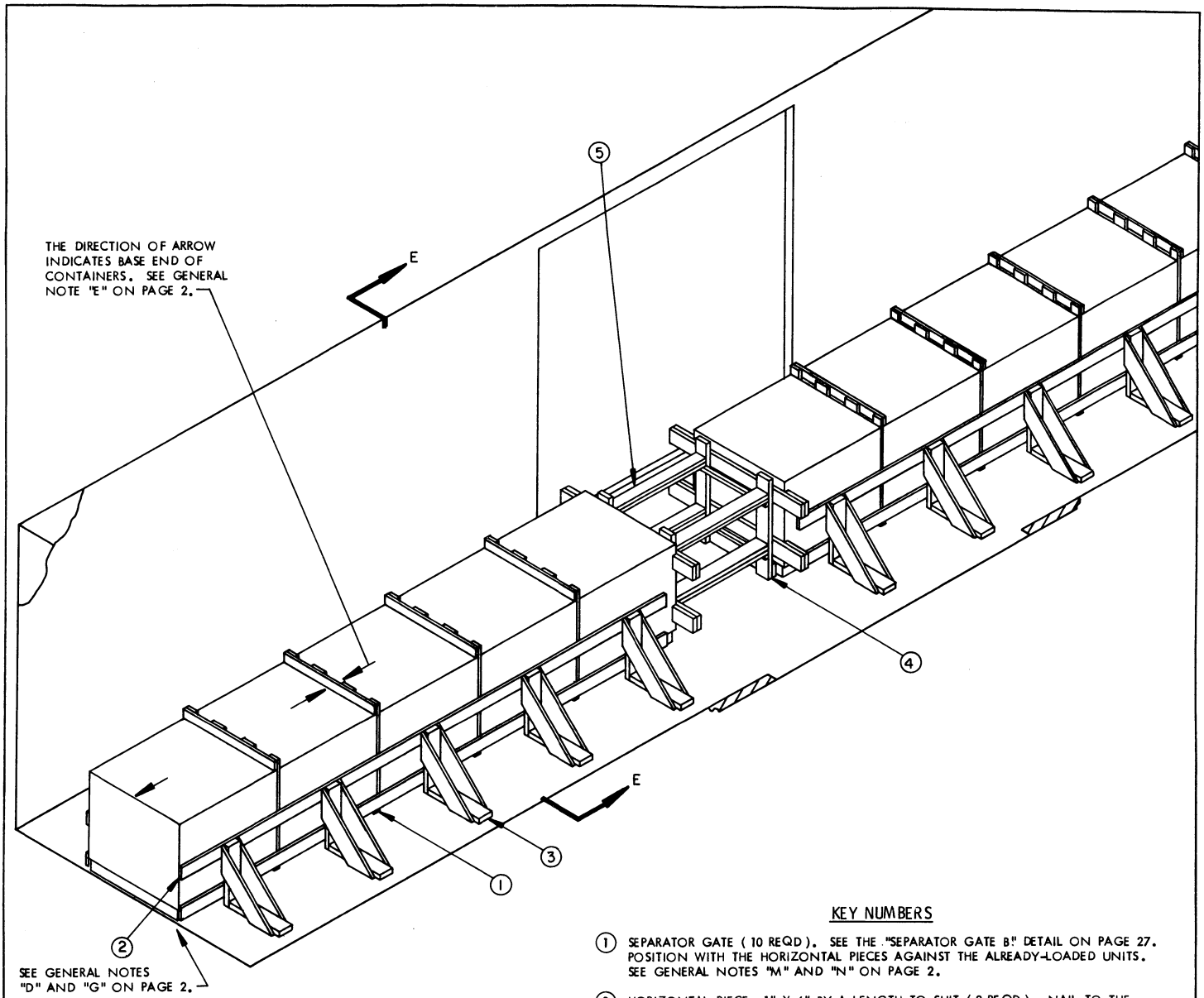
(G) BACK-UP CLEAT, 2" X 4" X 30" (2 REQD); NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-8d NAILS.

(H) HOLD-DOWN CLEAT, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE "VIEW A" DETAIL ABOVE FOR LOCATION DIMENSIONS.



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

BRACE
4" X 4" MATERIAL



ISOMETRIC VIEW

KEY NUMBERS

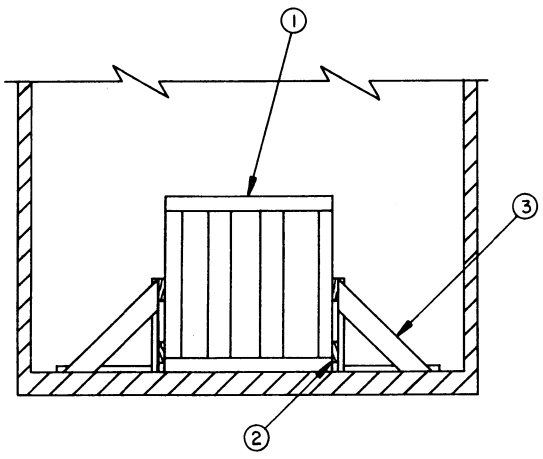
(1) SEPARATOR GATE (10 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.

(2) 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 28 FOR HEIGHT LOCATION GUIDANCE.

(3) LCL BRACE (24 REQD). SEE THE DETAIL ON PAGE 28 AND SPECIAL NOTE 3 ON PAGE 27. POSITION AS SHOWN AND NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "R" ON PAGE 2.

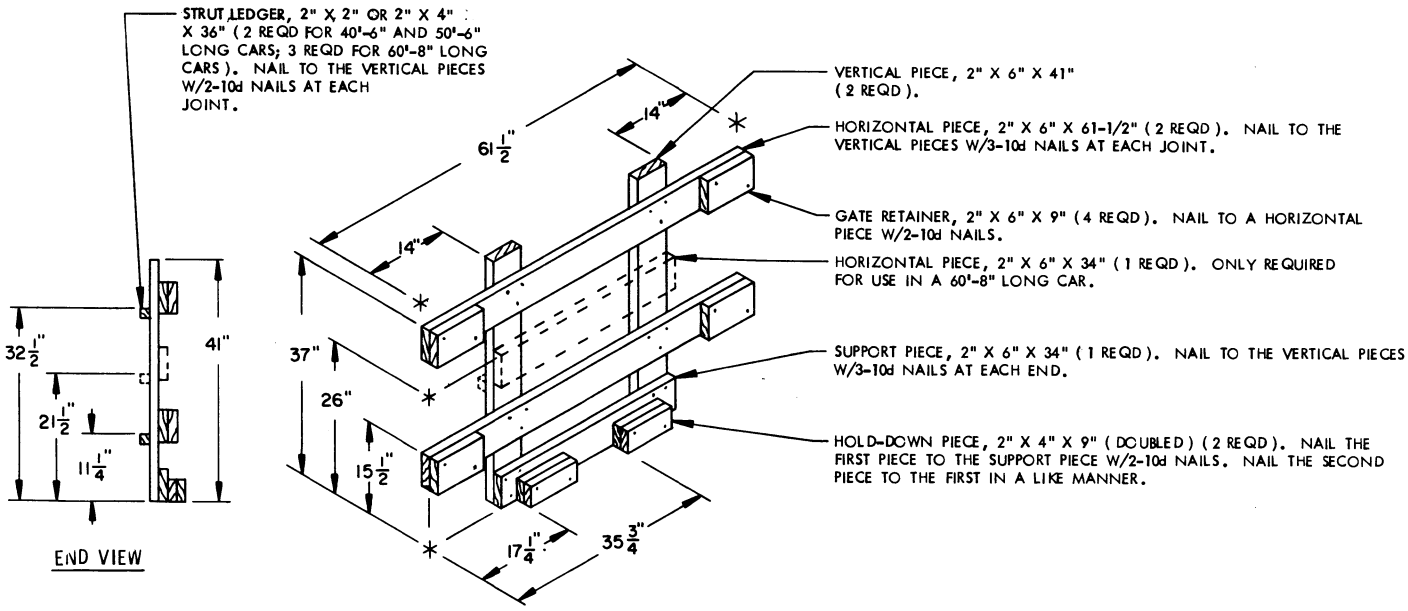
(4) CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 27.

(5) STRUT, 2" X 6" BY CUT TO FIT (REF: 45") (DOUBLED) (4 REQD). LAMINATE W/1-10d NAIL EVERY 6" AND TOENAIL THE TOP PIECE TO PIECES MARKED (4) W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "T" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 27.



SECTION E-E

TYPICAL LCL LOAD USING A 1-WIDE LOADING METHOD



CENTER GATE B

THIS GATE IS TO BE USED WITH THE 1-WIDE LOAD ON PAGE 26.

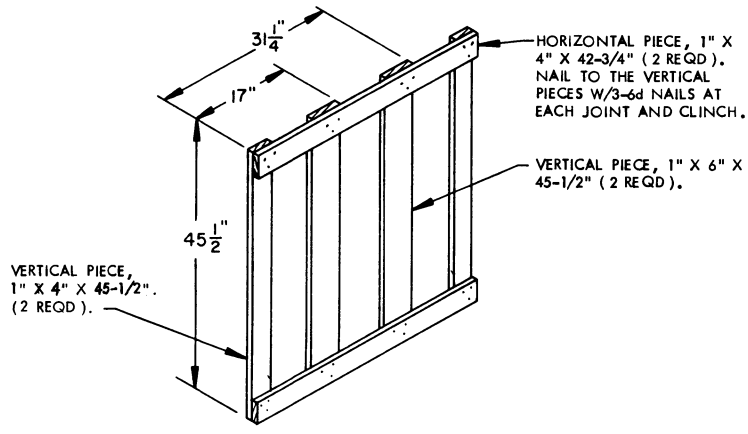
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND LENGTHS CAN BE USED. SEE SPECIAL NOTE 2.
2. A 1- WIDE LOAD IN A 50'-6" LONG CAR IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR A 10-UNIT LOAD IN A 40'-6" LONG CAR. IF A 15-UNIT LOAD IS SHIPPED IN A 60'-8" LONG CAR, SIX (6) STRUTS WILL BE REQUIRED INSTEAD OF FOUR (4).
3. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE UNIT WIDTH, WITH SLIGHT ADJUSTMENTS AS NECESSARY TO ALIGN A BRACE WITH THE CENTER COLLAR OF THE CONTAINER.
4. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED LOAD AND THEREFORE ONLY TYPICAL.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	147	49
1" X 6"	363	182
2" X 4"	6	4
2" X 6"	172	172
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/2
8d (2-1/2")	288	3-1/4
10d (3")	108	1-3/4
16d (3-1/2")	64	1-1/2

LOAD AS SHOWN

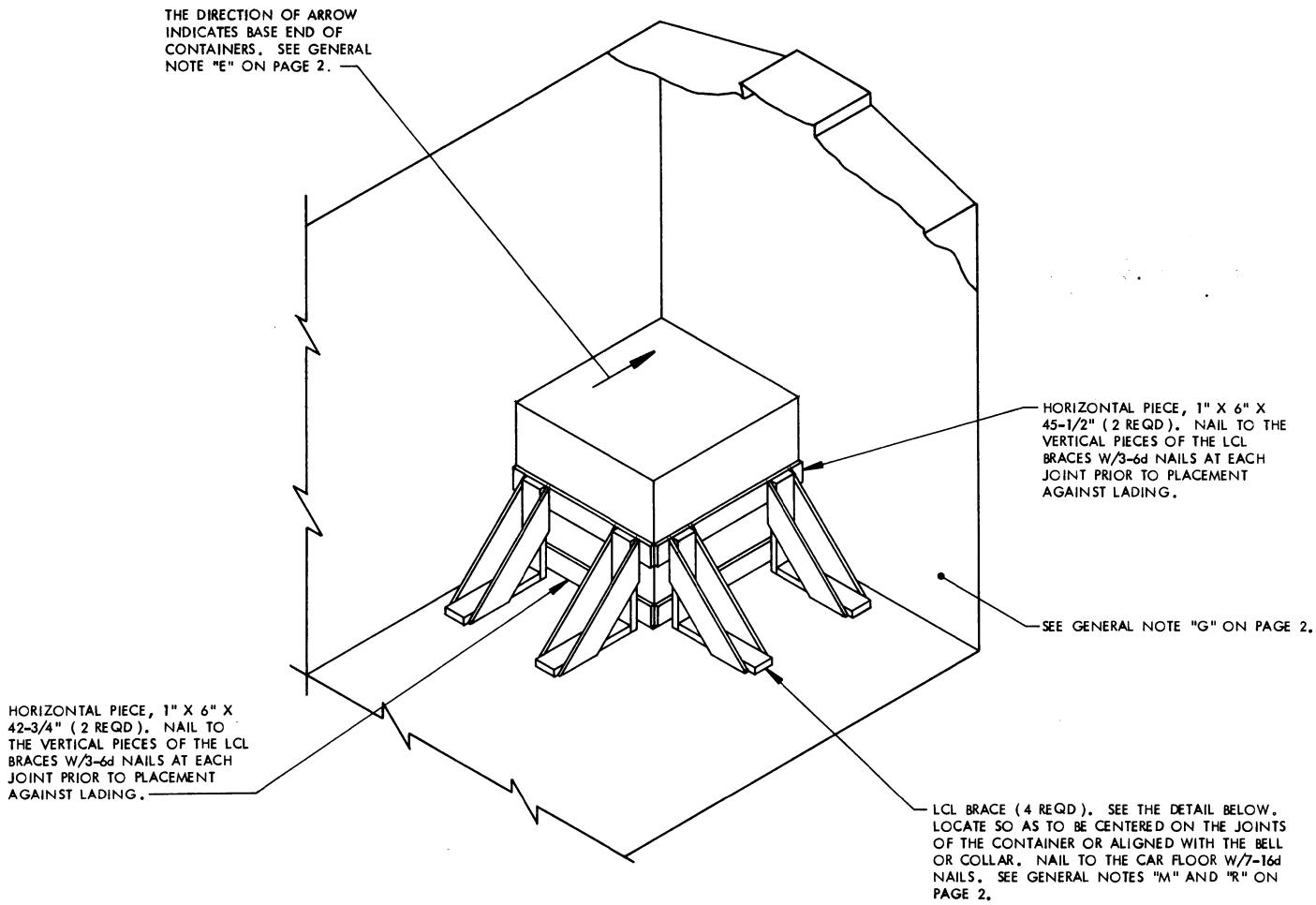
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	28,128 LBS
DUNNAGE		827 LBS
TOTAL WEIGHT		28,955 LBS (APPROX)



SEPARATOR GATE B

THIS GATE IS TO BE USED WITH THE 1-WIDE LOAD ON PAGE 26.

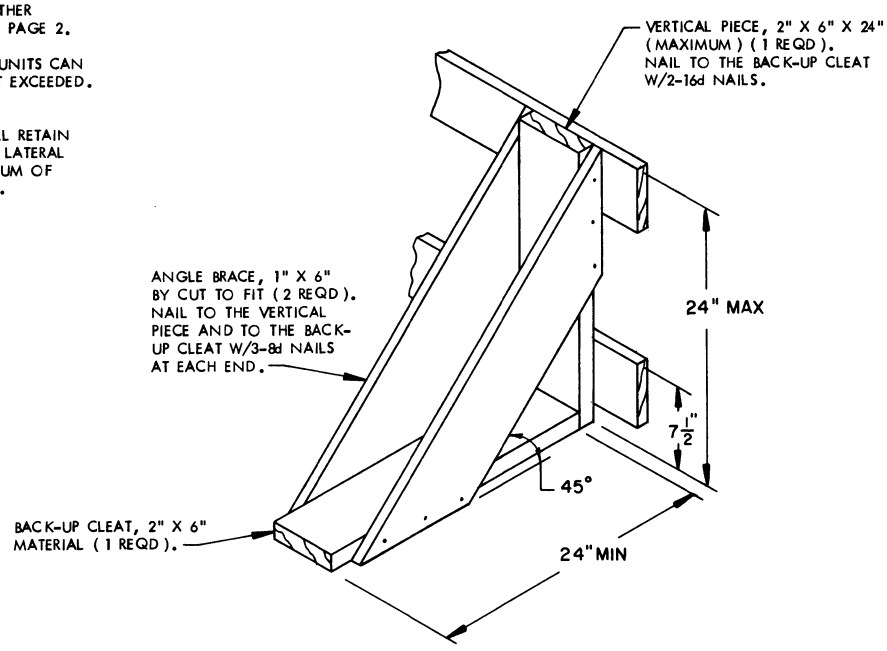
TYPICAL LCL LOAD USING A 1-WIDE LOADING METHOD



ISOMETRIC VIEW

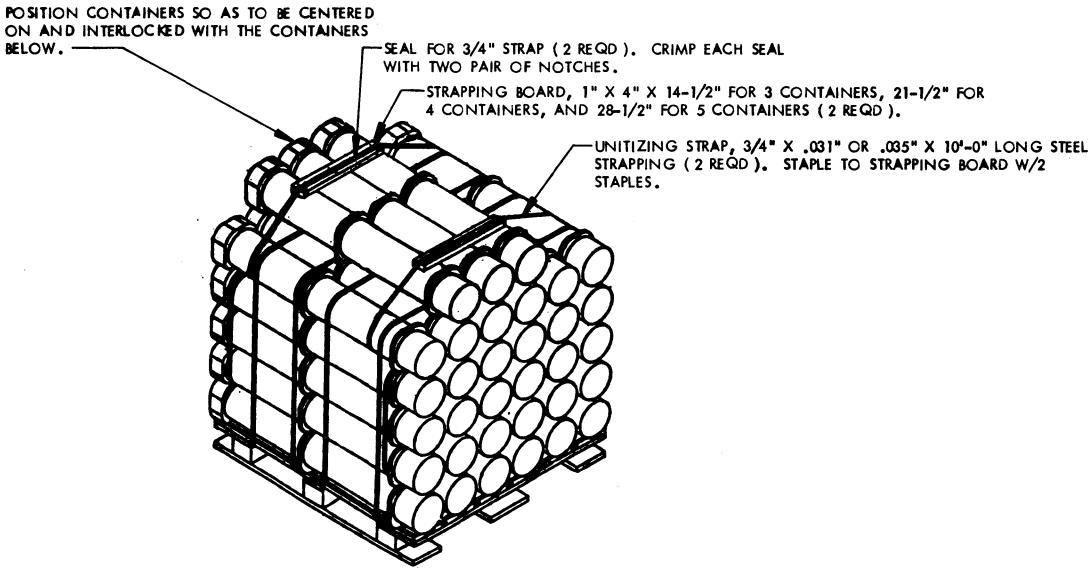
SPECIAL NOTES:

1. AN 8'-6" 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 "D" AND "R" ON PAGE 2.
2. THE LOAD SHOWN IS TYPICAL, OTHER QUANTITIES OF PALLET UNITS CAN BE SHIPPED AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3 BELOW.
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



SECUREMENT OF THREE CONTAINERS

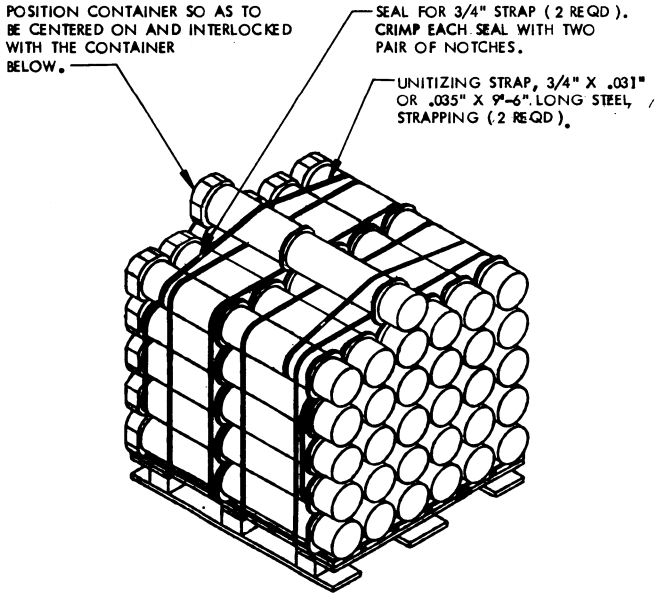
SPECIAL NOTES:

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 WITHIN A LAYER AS SHOWN ON PAGES 12 AND 13.

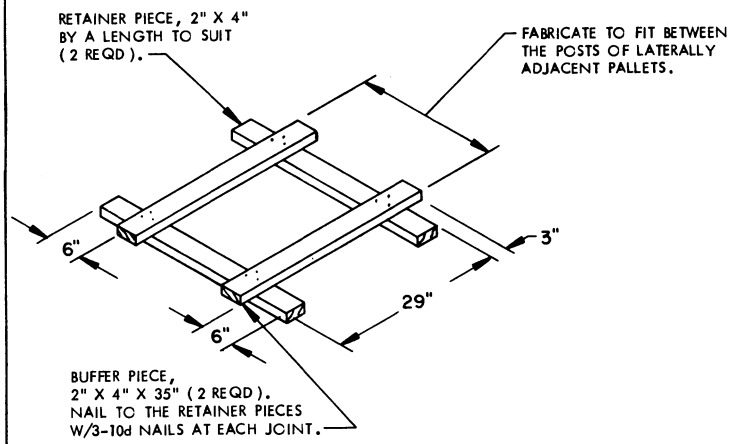
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS 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.

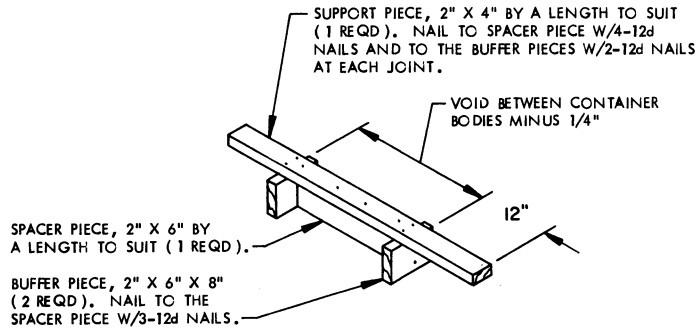


SECUREMENT OF ONE CONTAINER

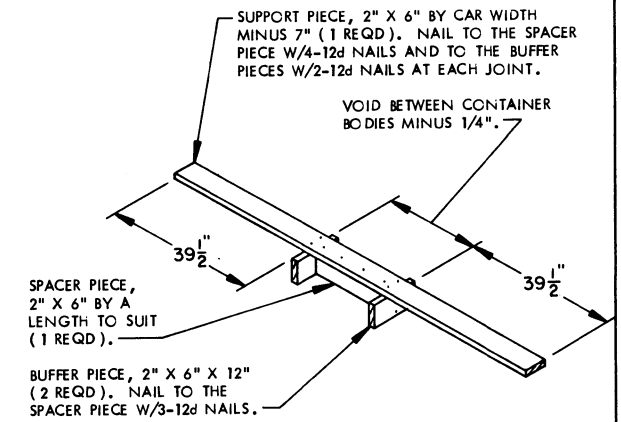


ANTI-SWAY BRACE

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

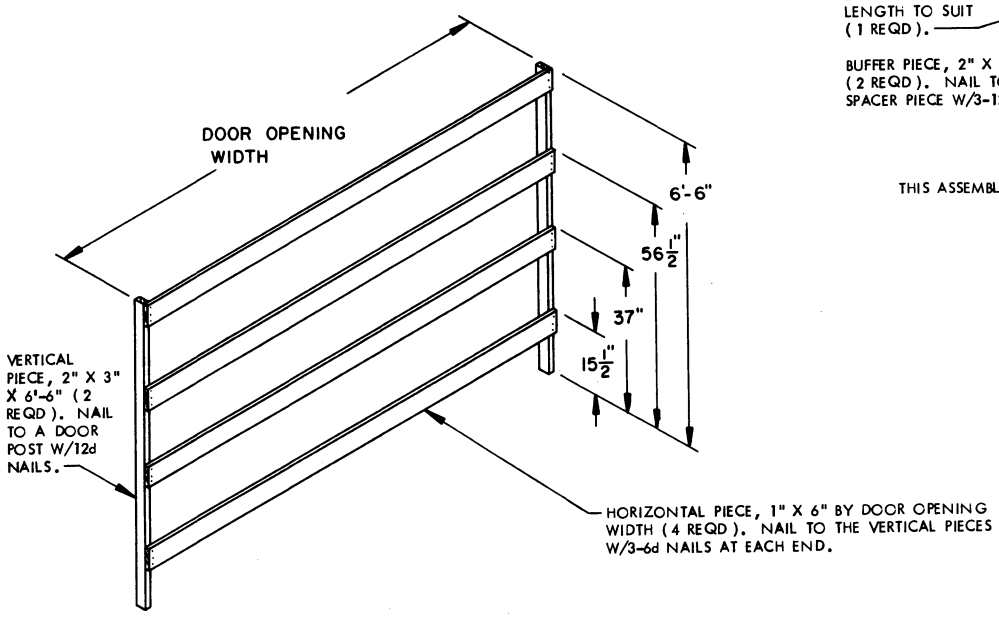


TOP-OF-LOAD ANTI-SWAY BRACE

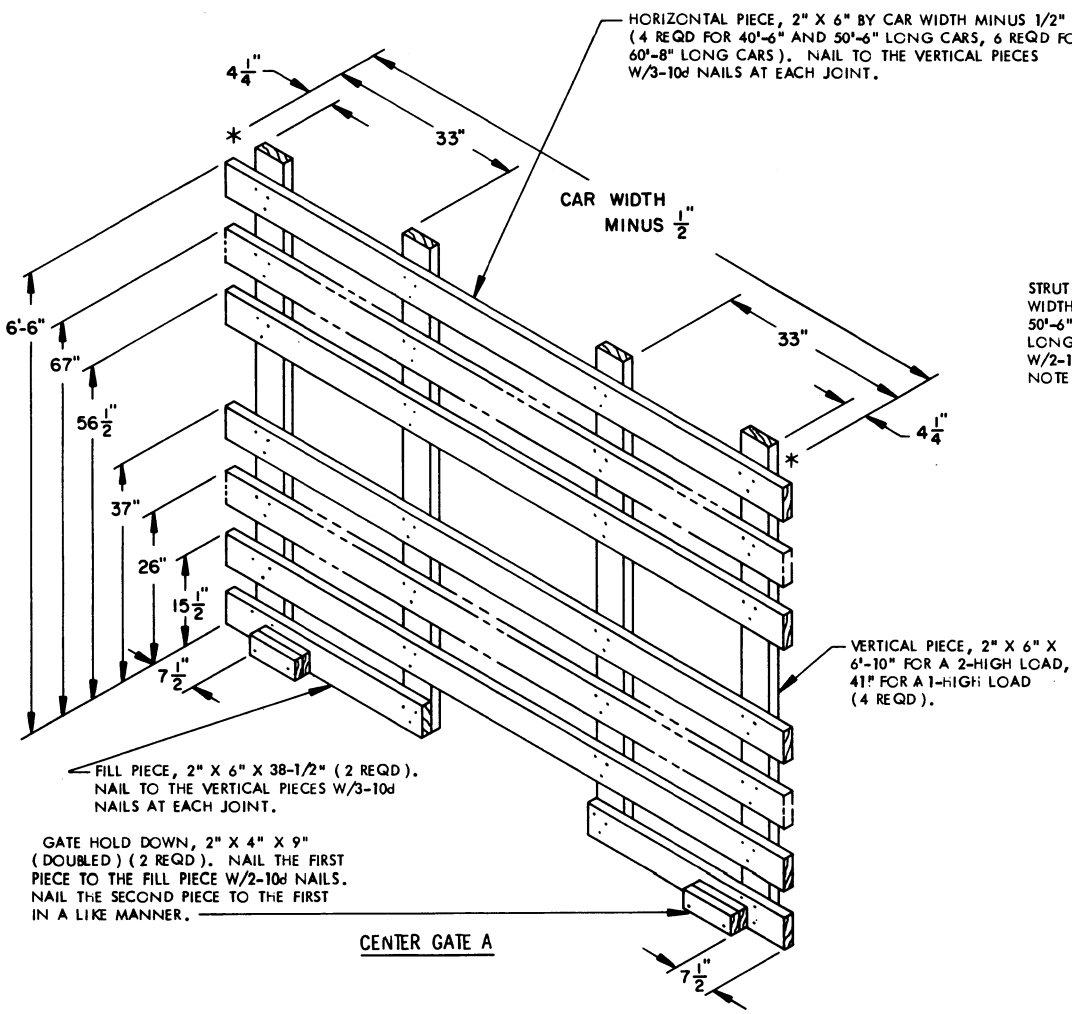


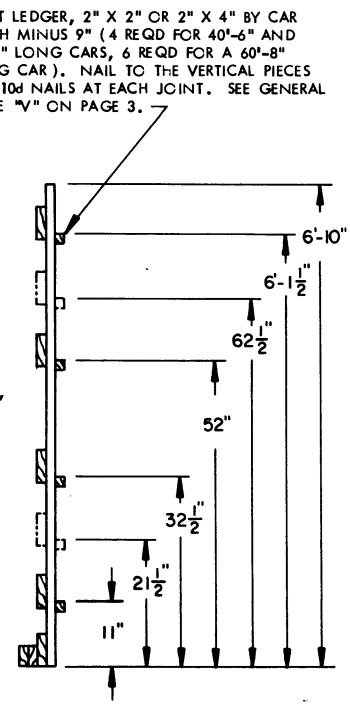
SPACER ASSEMBLY B

THIS ASSEMBLY IF FOR USE IN THE LOAD ON PAGE 8.

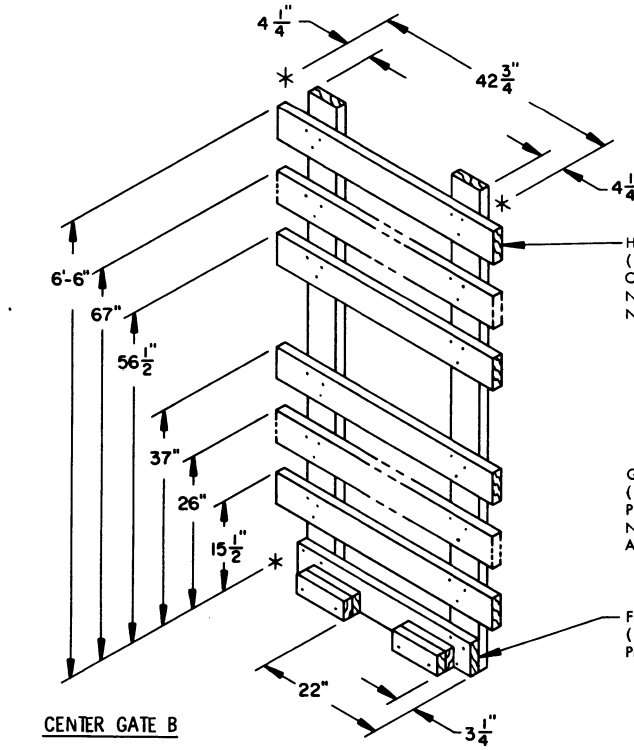


DOORWAY PROTECTION

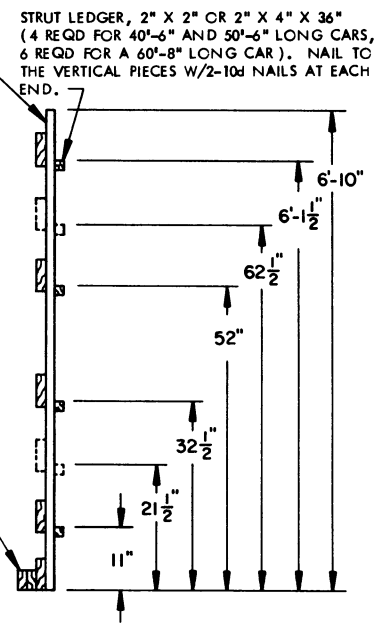




END VIEW

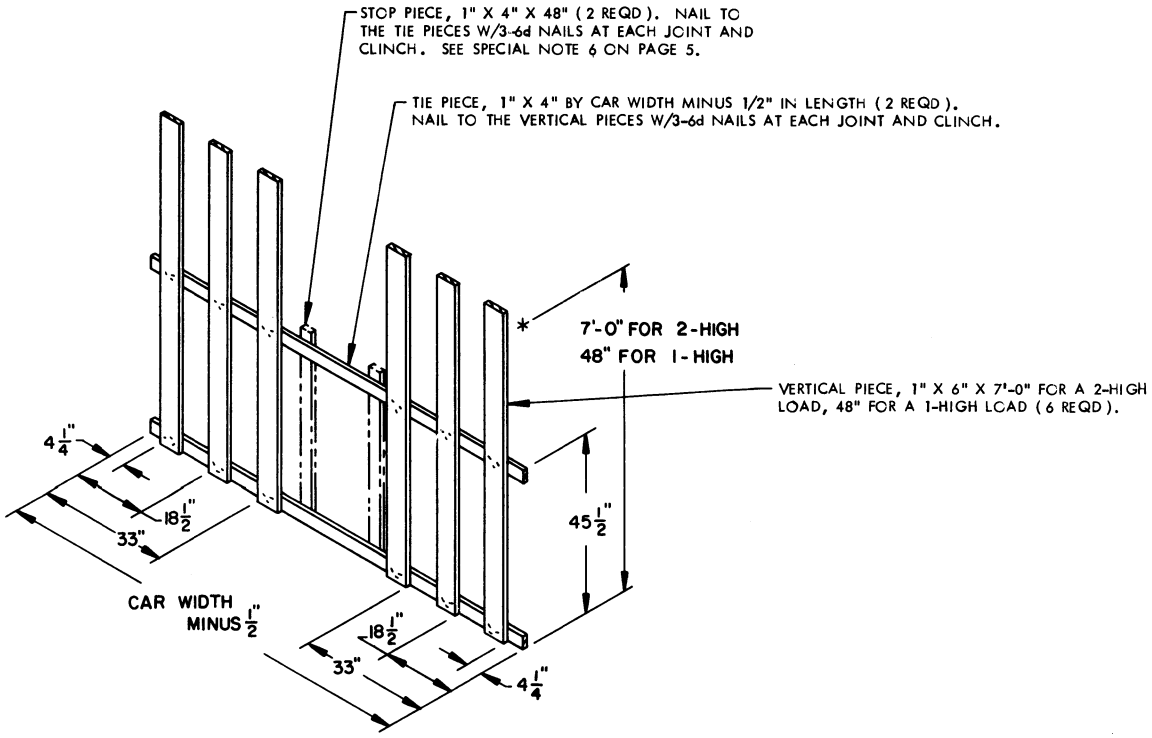


SEE SPECIAL NOTE 10 ON PAGE 5



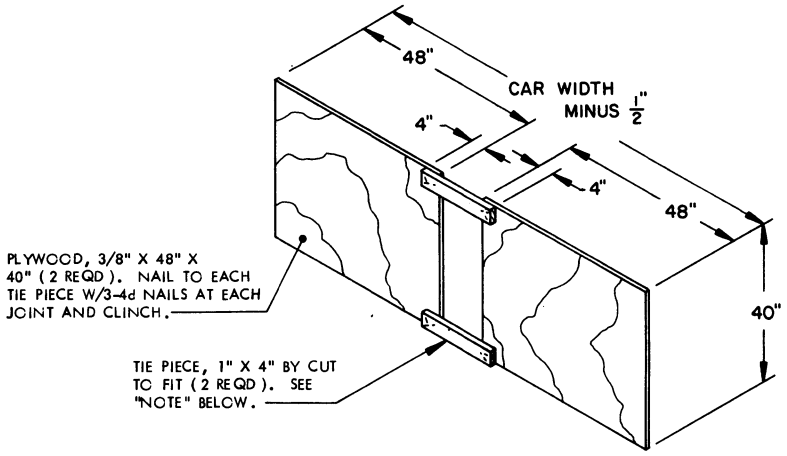
END VIEW

DETAILS



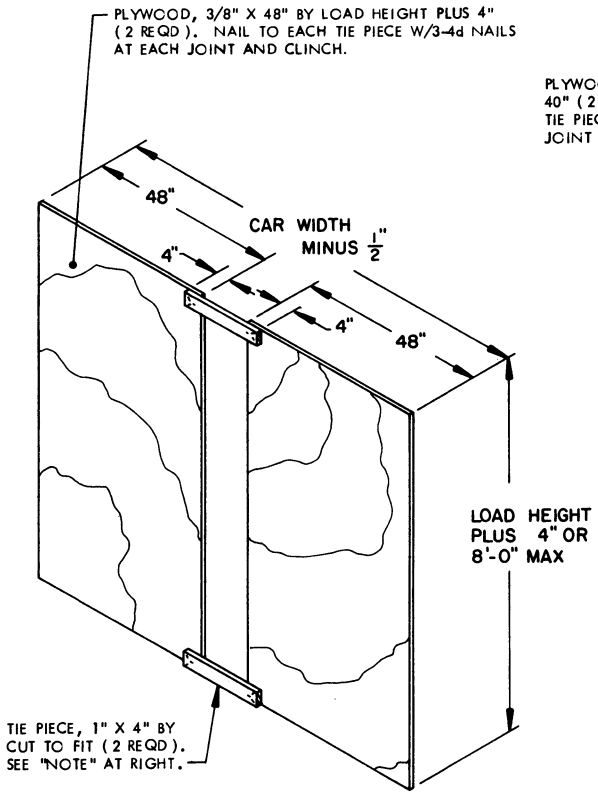
SEPARATOR GATE A

SEE SPECIAL NOTE 8 ON PAGE 5.



ALTERNATIVE SEPARATOR GATE B

(FOR USE IN THE LCL LOADS ON PAGES 12, 13, AND 16)

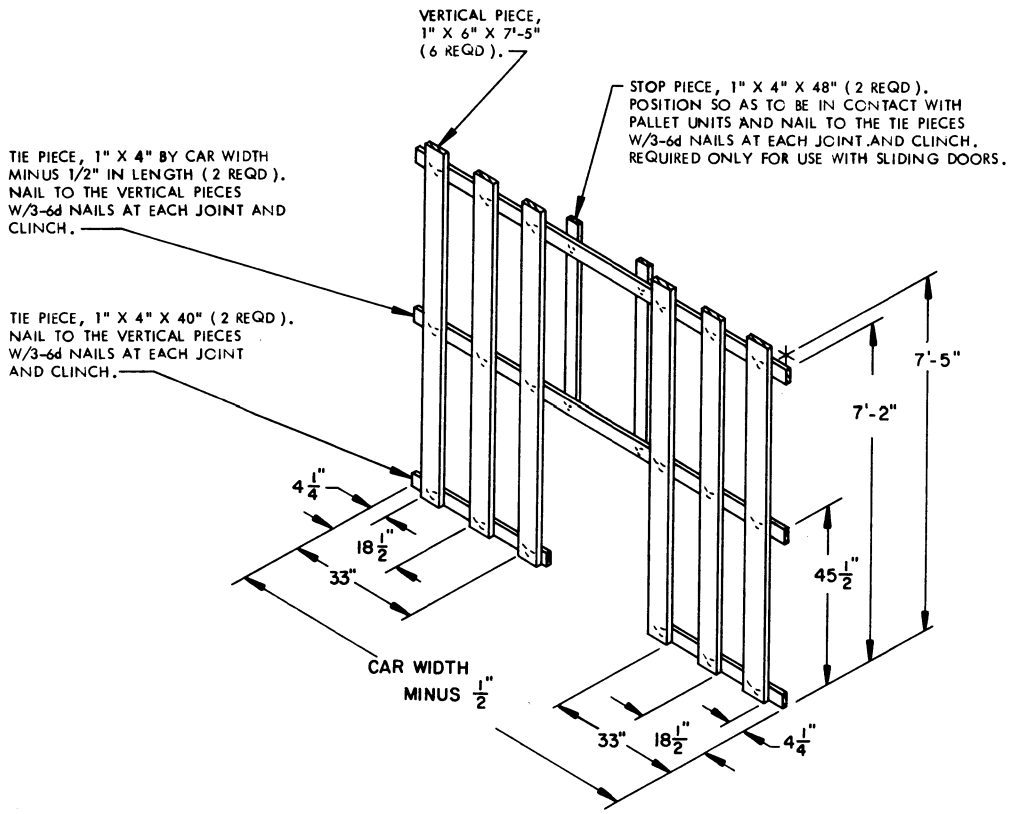


ALTERNATIVE SEPARATOR GATE A

SEE SPECIAL NOTE 7 ON PAGE 5.

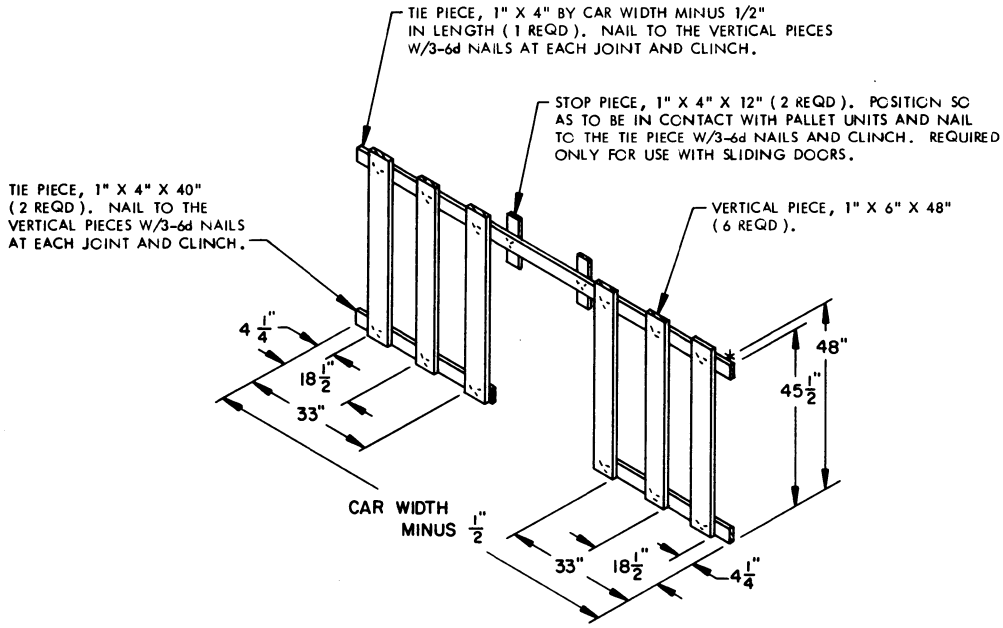
NOTE:

THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LIEU OF THE SEPARATOR GATE SHOWN WITHIN A LOAD, WHICH IS FABRICATED FROM 1" X 4" AND 1" X 6" MATERIAL. WHEN THE ALTERNATIVE SEPARATOR GATE IS BEING USED IN A CONVENTIONAL BOX CAR AND NAILED FLOOR-LINE BLOCKING IS TO BE USED FOR DOORWAY PROTECTION IN LIEU OF THE WOODEN GATE TYPE, THE LOWER TIE PIECE MUST BE POSITIONED AT LEAST 3-1/2" OFF THE FLOOR. ALSO, THE LOWER INSIDE CORNER OF EACH PLYWOOD SHEET MUST BE CUT OUT 3-1/2" HIGH BY 7" WIDE. THE USE OF THIS MODIFIED GATE WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOADS.



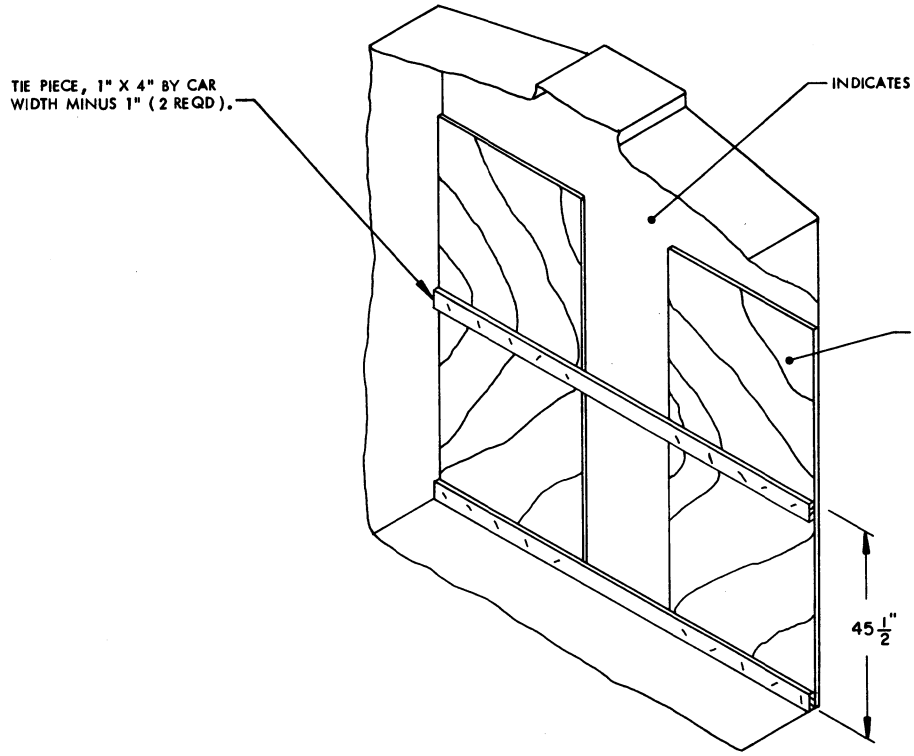
SEPARATOR GATE C

THIS SEPARATOR GATE IS FOR USE IN THE DOORWAY AREA OF A 2-HIGH LOAD WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION. SEE SPECIAL NOTE 8 ON PAGE 5.



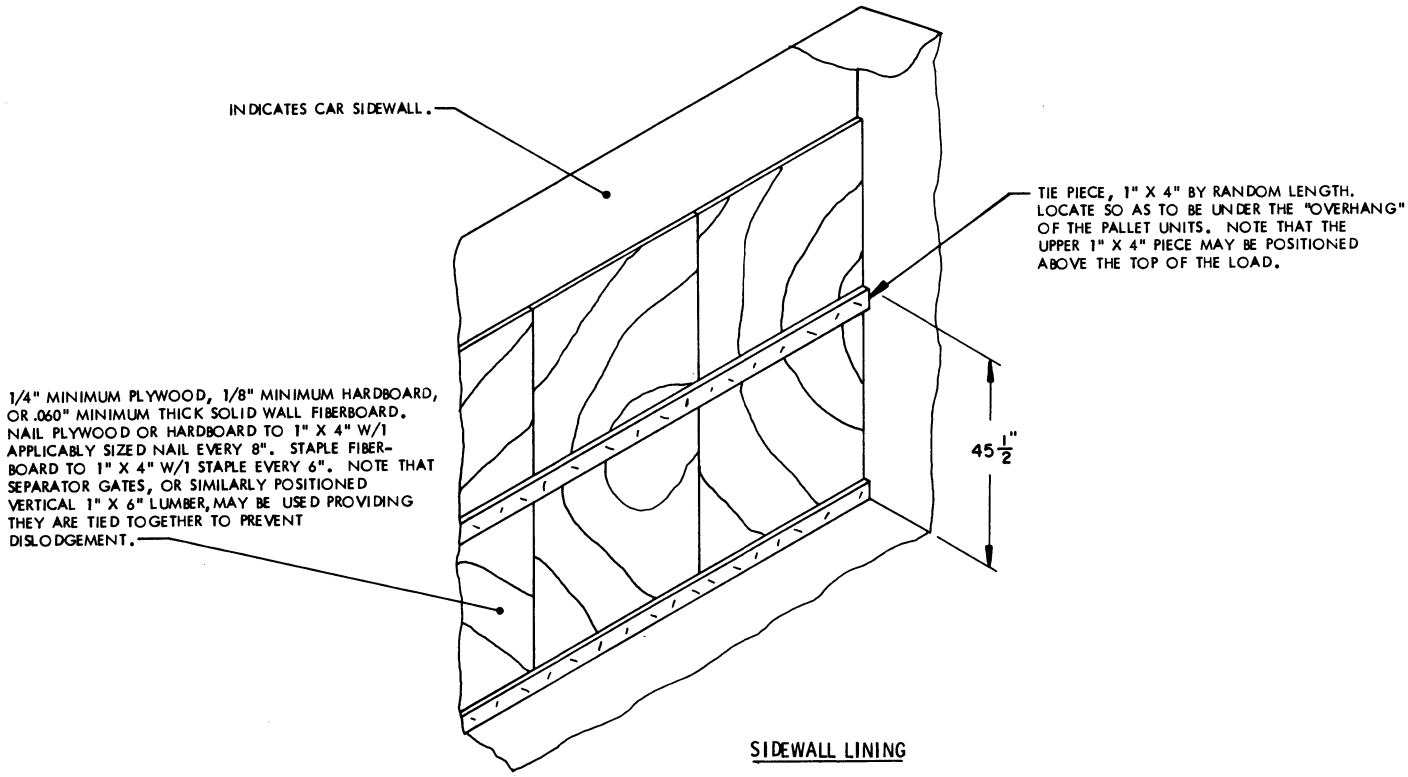
SEPARATOR GATE D

THIS SEPARATOR GATE IS FOR USE IN THE DOORWAY AREA OF A 1-HIGH LOAD WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION.



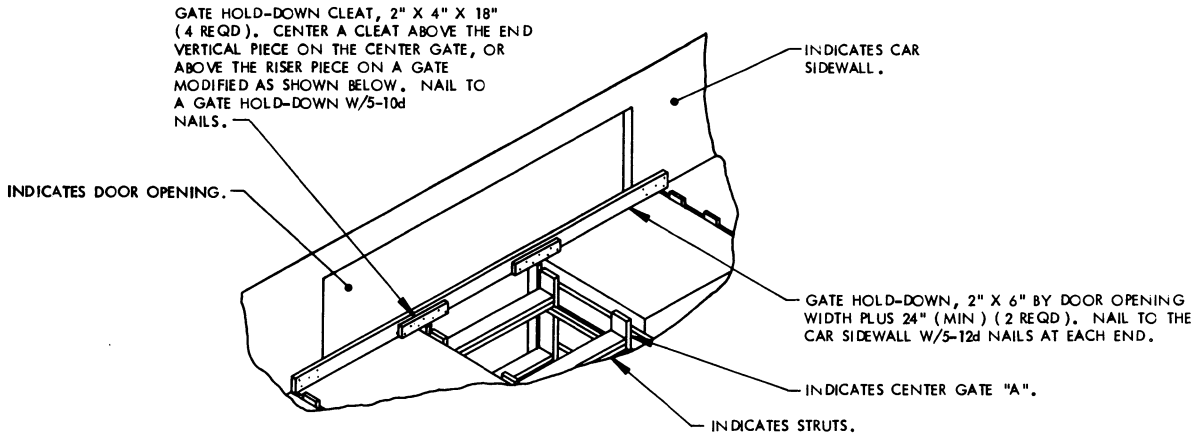
END WALL LINING

THIS VIEW DEPICTS LINING REQUIRED FOR A LOAD IN A CAR EQUIPPED WITH A STEEL END WALL.



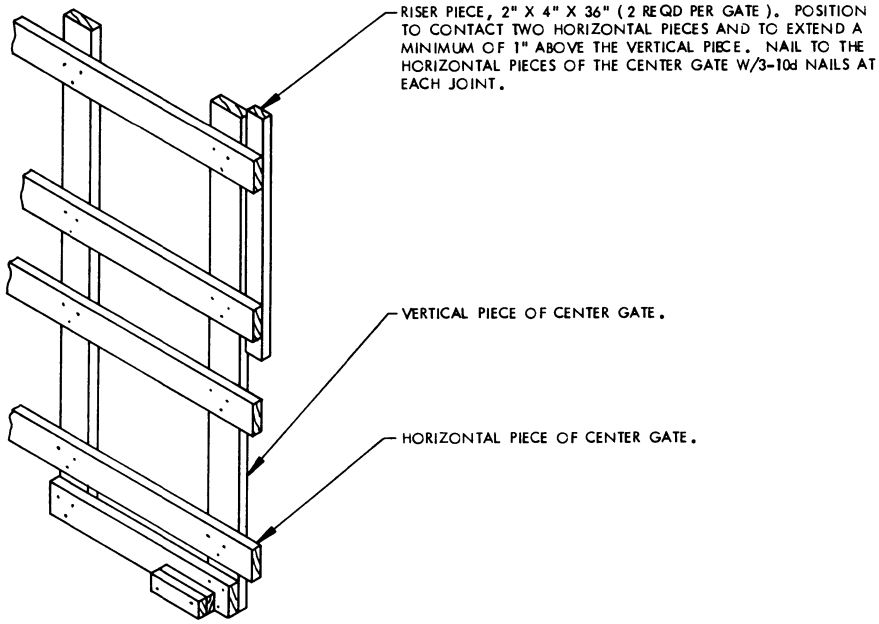
SIDEWALL LINING

THIS VIEW DEPICTS LINING REQUIRED FOR A CAR EQUIPPED WITH A STEEL SIDEWALL. NOTE THAT IF THE CAR IS EQUIPPED WITH A STEEL-FACED PLUG DOOR, THE SPECIAL LINING WILL ALSO BE REQUIRED IN THE DOORWAY AREA IF THE SPECIFIED DOORWAY PROTECTION DOES NOT SUFFICE.



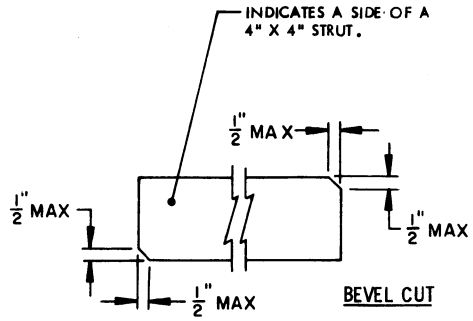
ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE 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: FOR A GATE NOT 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.



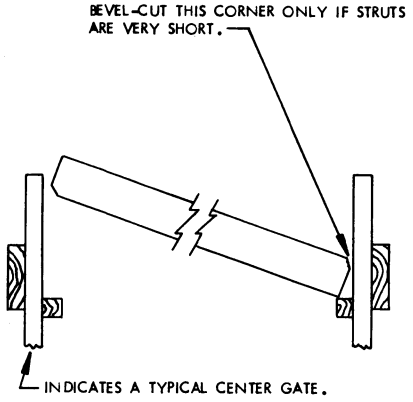
CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THIS VIEW ARE APPLICABLE FOR CENTER GATE "A" WHICH HAS THE VERTICAL PIECES INSET FROM THE END OF THE HORIZONTAL PIECES AS SHOWN ABOVE. THE RISER PIECE WILL PROVIDE A MEANS FOR CONTACTING THE GATE WITH THE GATE HOLD-DOWN.



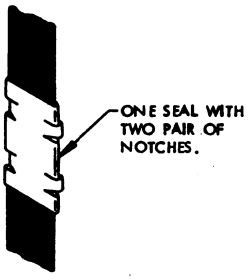
BEVEL CUT

BEVEL CUTTING THE STRUTS IS ONLY APPLICABLE FOR 4" X 4" STRUTS IF THEY ARE USED IN LIEU OF DOUBLED 2" X 6" AS PERMITTED BY SPECIAL NOTE 12 ON PAGE 5. BEVEL CUTTING 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 "T" ON PAGE 2 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE. NOTE THAT THIS VIEW IS ONLY APPLICABLE FOR 4" X 4" STRUTS.

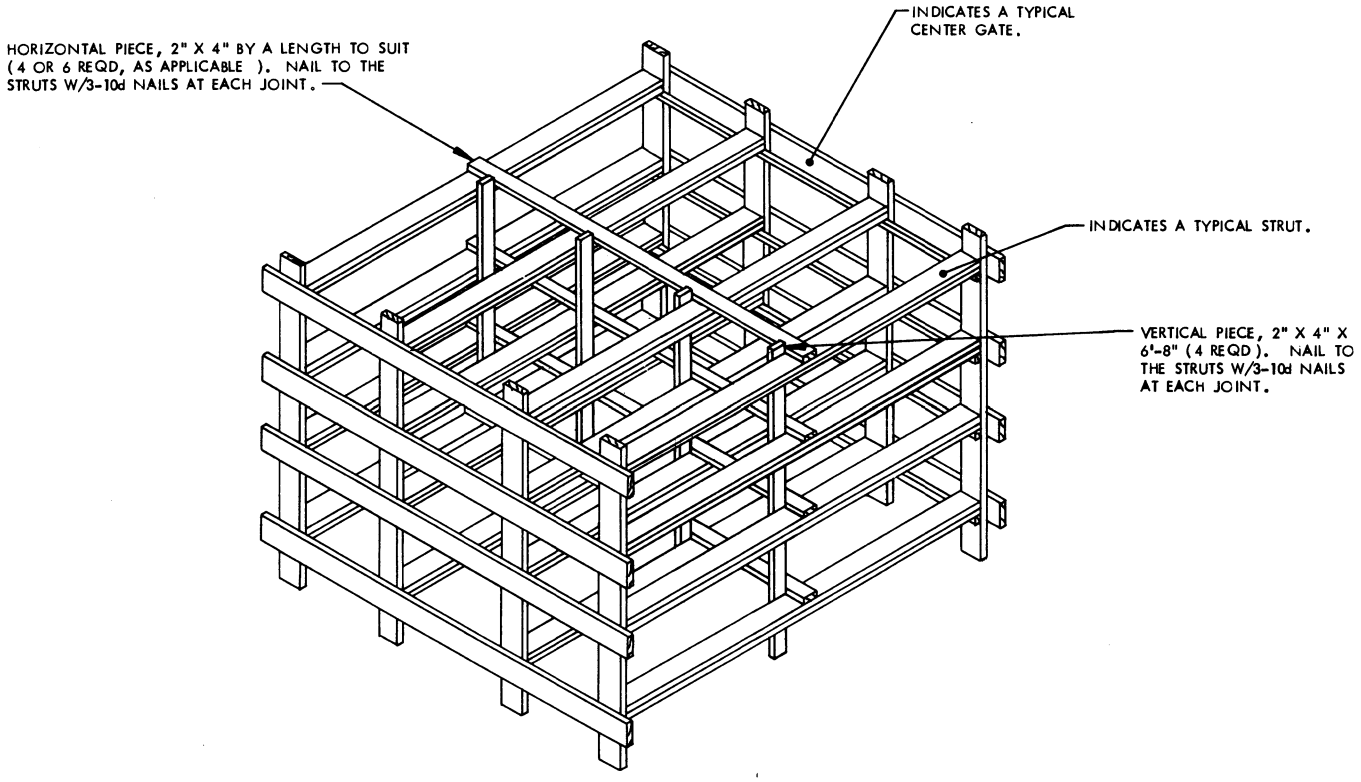


STRAP JOINT A

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

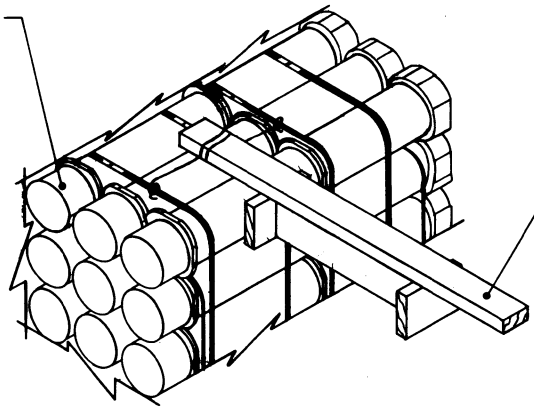
STRAP JOINT B

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



TYPICAL STRUT BRACING

NOTE: STRUT BRACING IS REQUIRED IF THE STRUTS ARE 48" LONG OR LONGER. SEE GENERAL NOTE "T" ON PAGE 2.



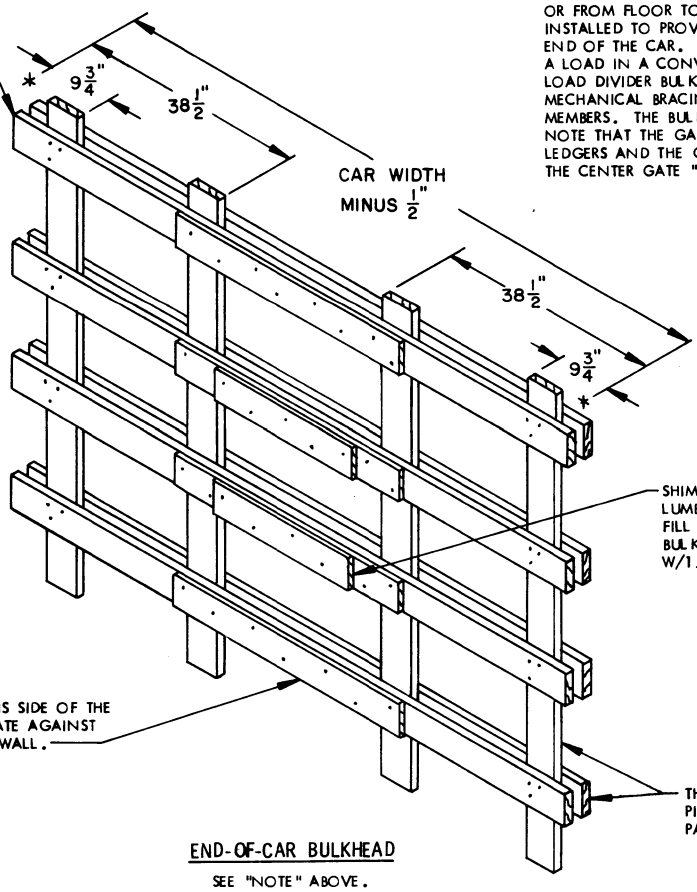
TIE WIRE APPLICATION

USE NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE SUPPORT PIECE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE UNDER AND AROUND A TIEDOWN STRAP ON THE UNIT AND TWIST WIRE TO SELF AS SHOWN.

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.

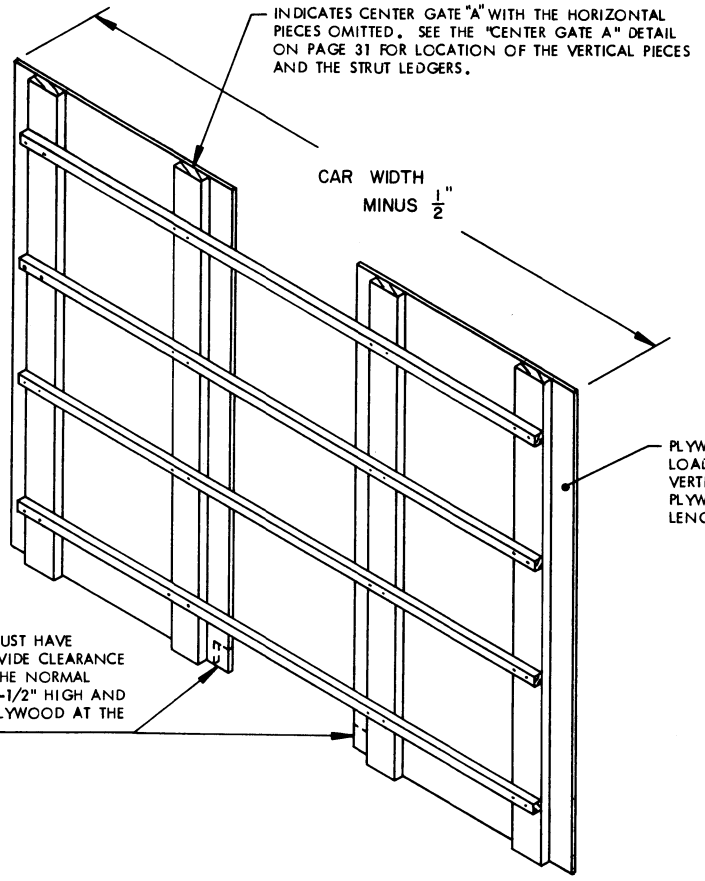
NOTE:

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. NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. REFER TO PAGE 31 FOR THE CENTER GATE "A" DETAIL.

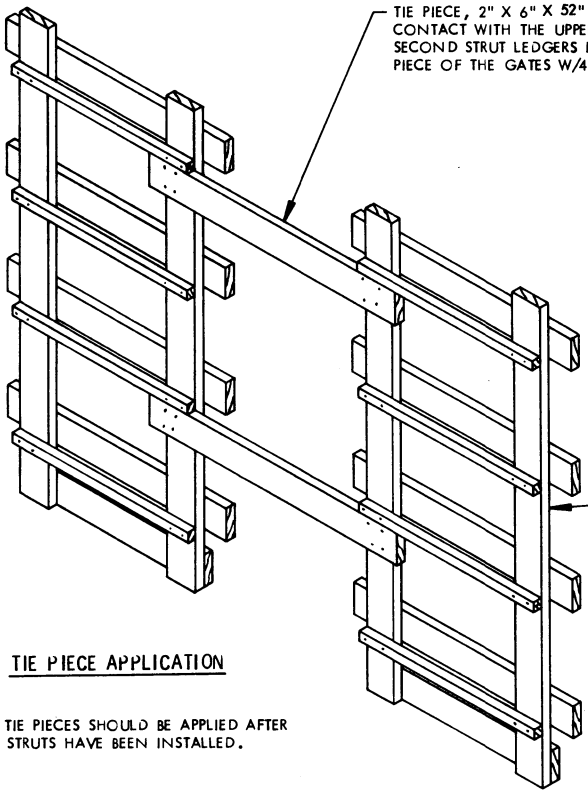


END-OF-CAR BULKHEAD

SEE "NOTE" ABOVE.



PLYWOOD CENTER GATE ALTERNATIVE

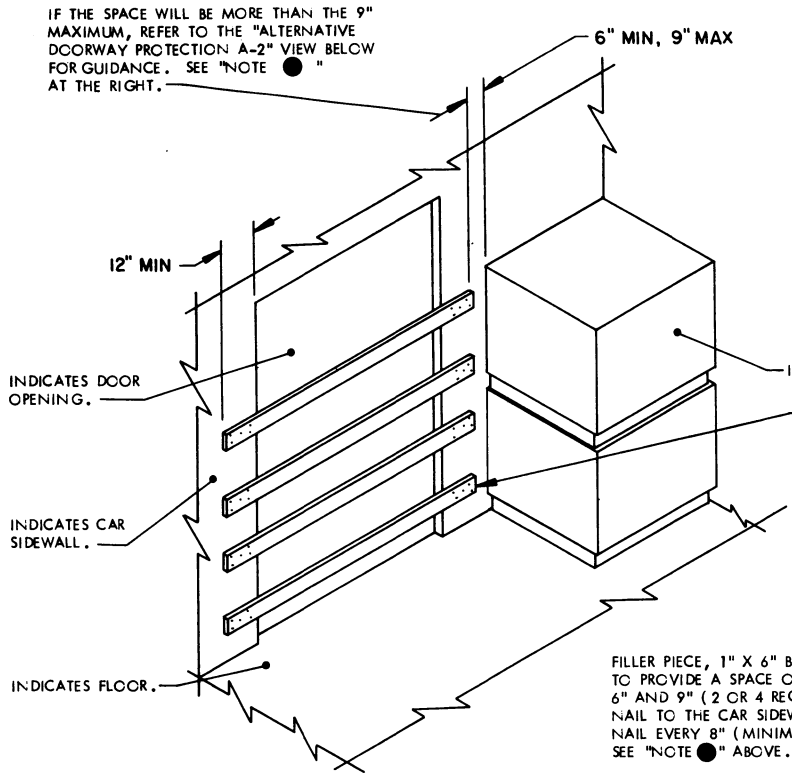


TIE PIECE APPLICATION

NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

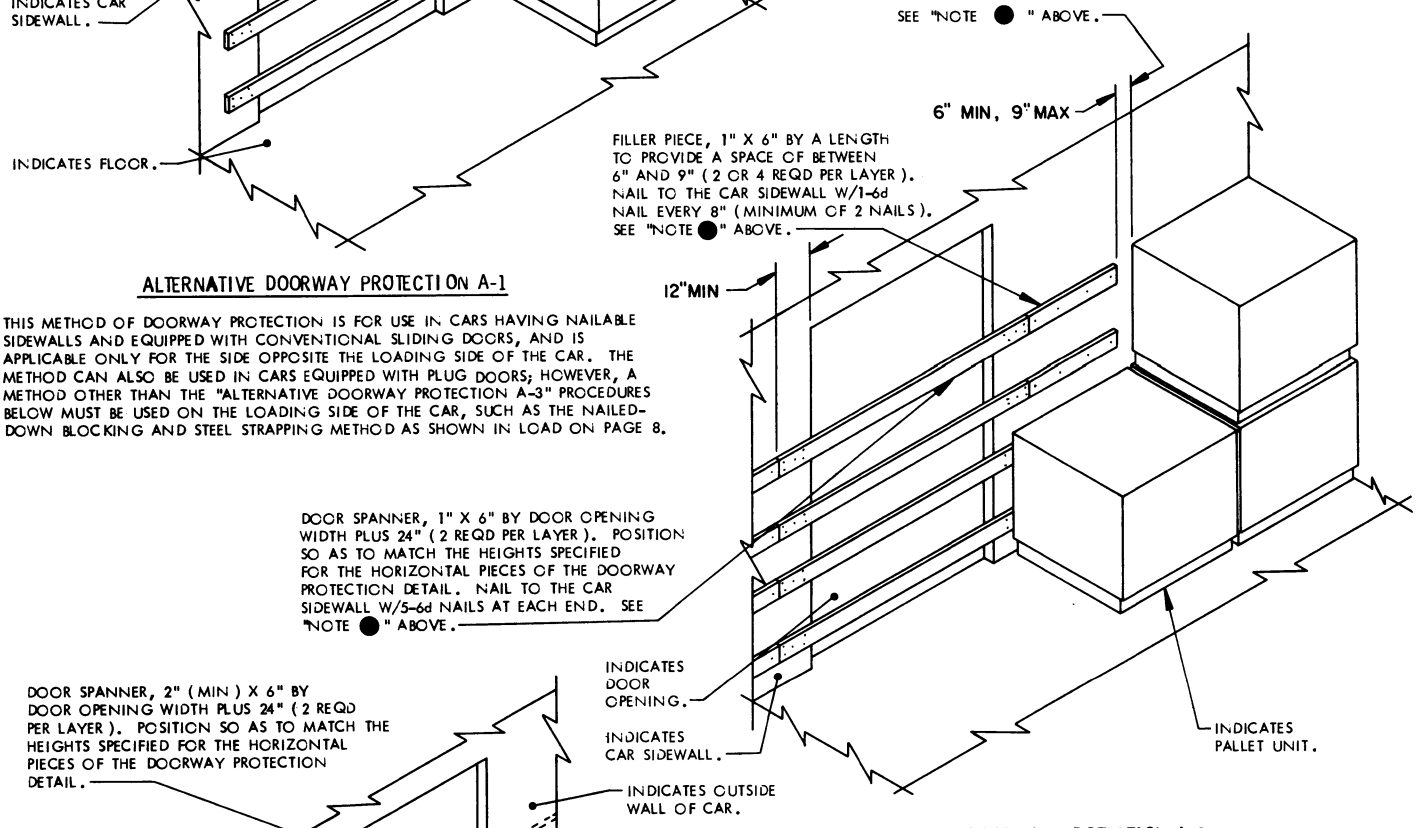
NOTE ● :

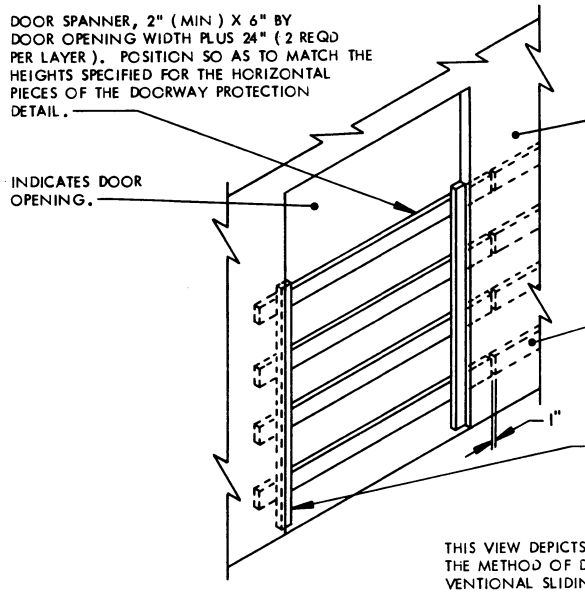
THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT.



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, SUCH AS THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD AS SHOWN IN LOAD ON PAGE 8.



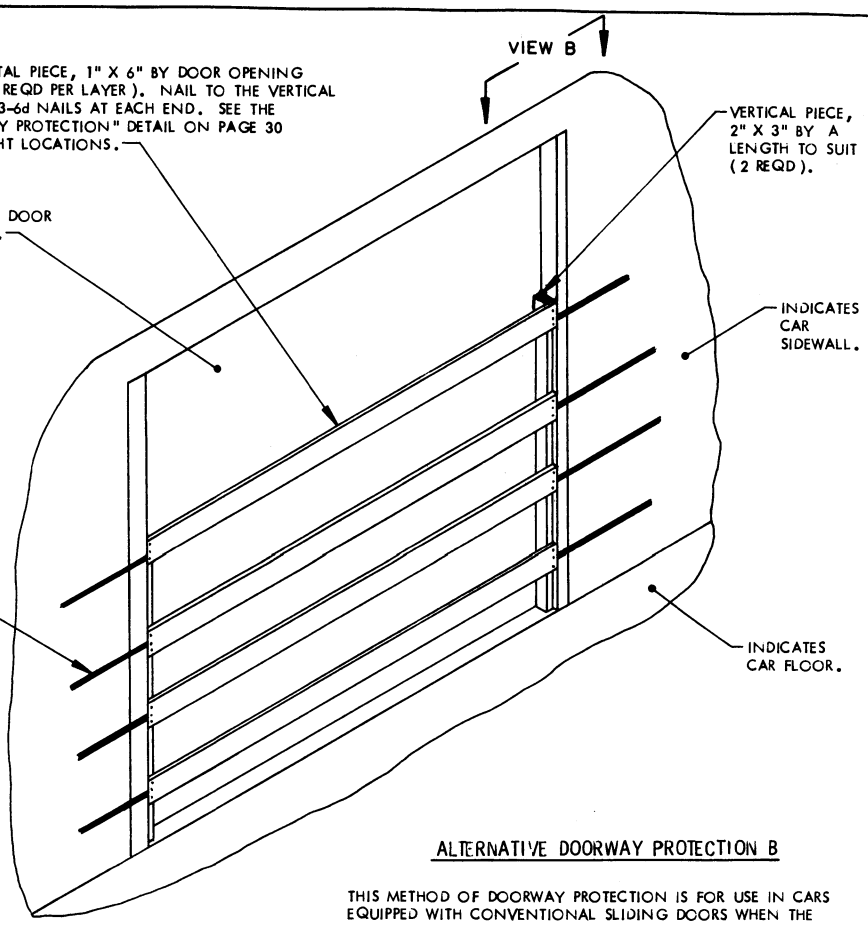


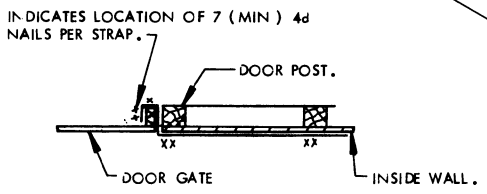
ALTERNATIVE DOORWAY PROTECTION A-2

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.



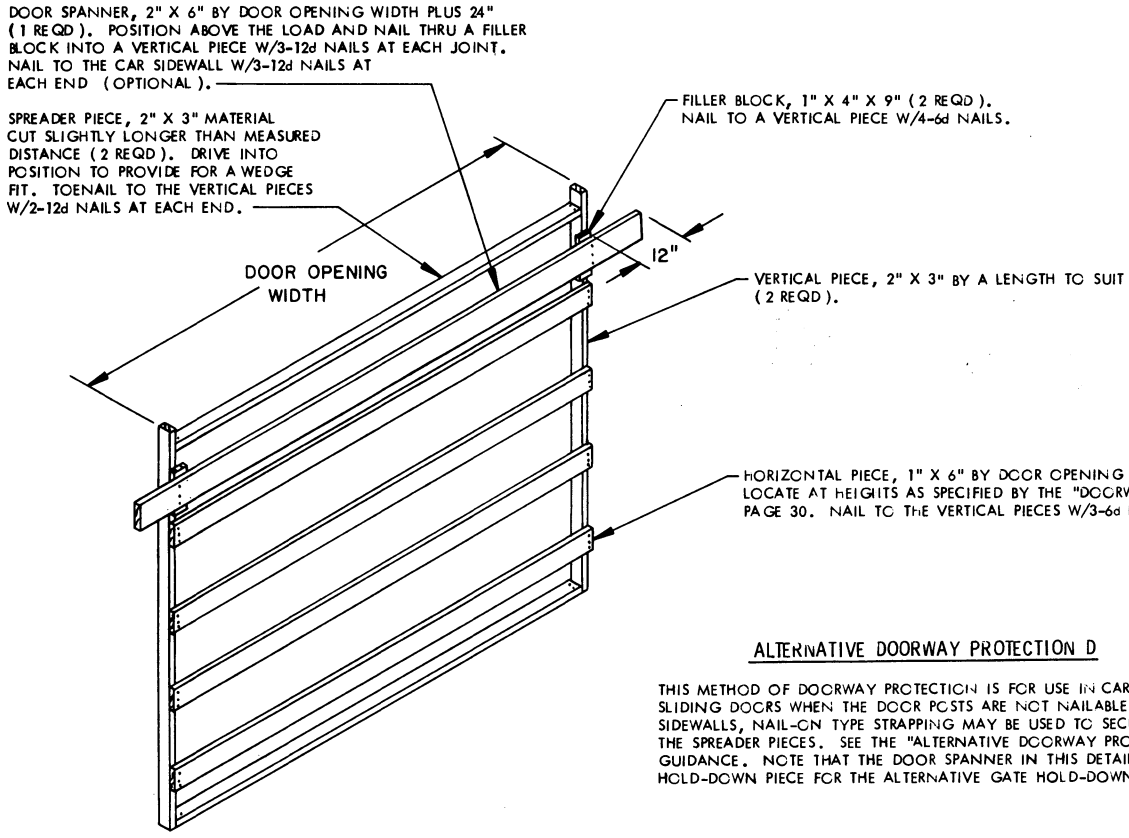


VIEW B

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.

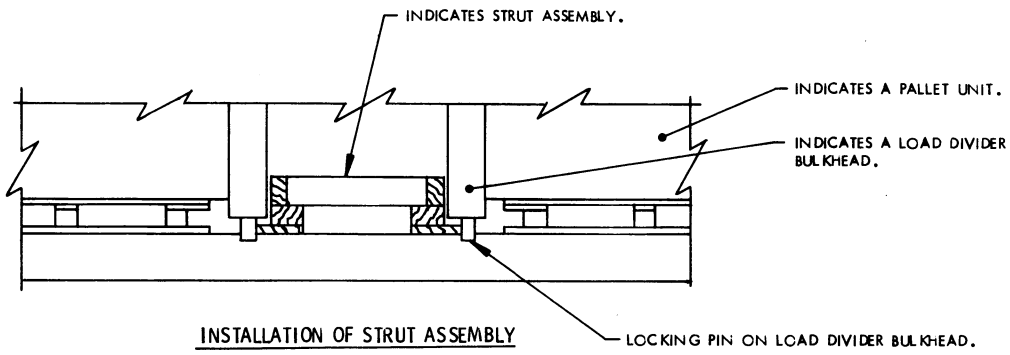
ALTERNATIVE DOORWAY PROTECTION B

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.



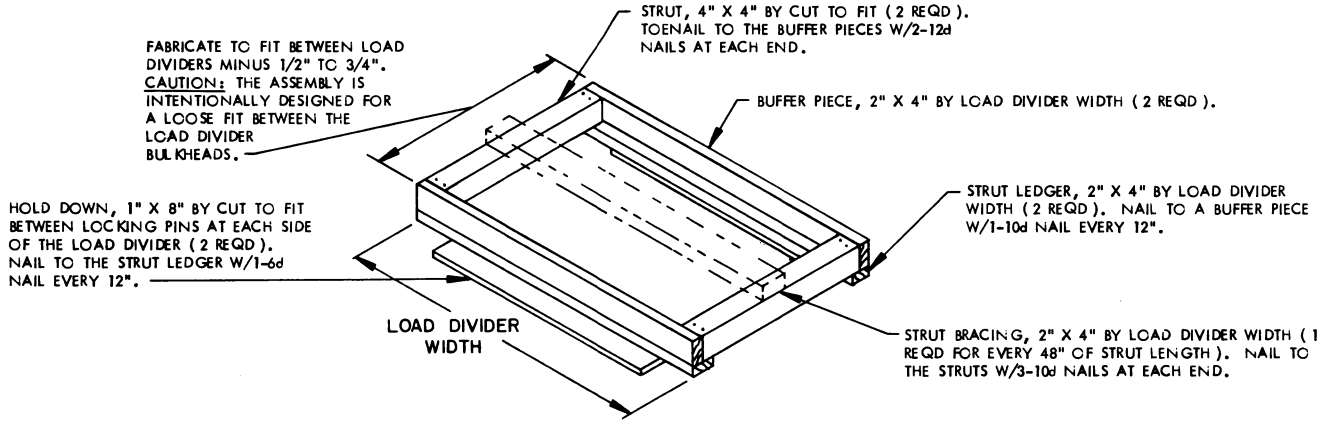
ALTERNATIVE DOORWAY PROTECTION D

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 ABOVE 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 35.



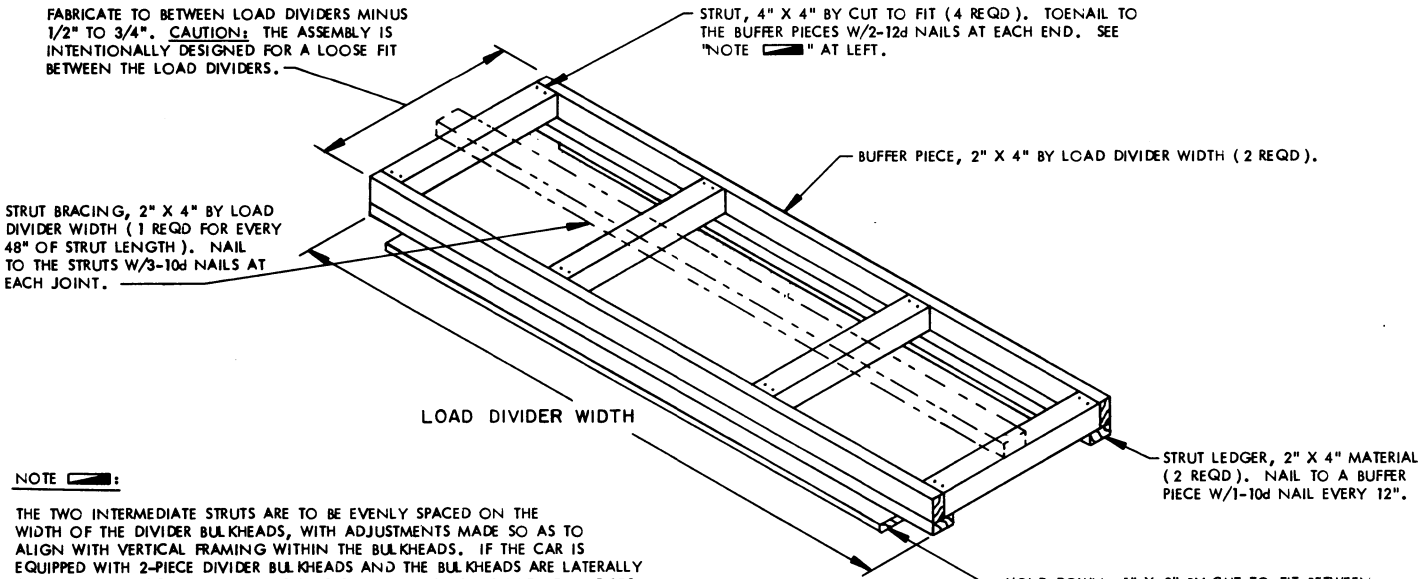
INSTALLATION OF STRUT ASSEMBLY

THIS VIEW SHOWS THE STRUT ASSEMBLY INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS. NOTE THE 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 CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C 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.

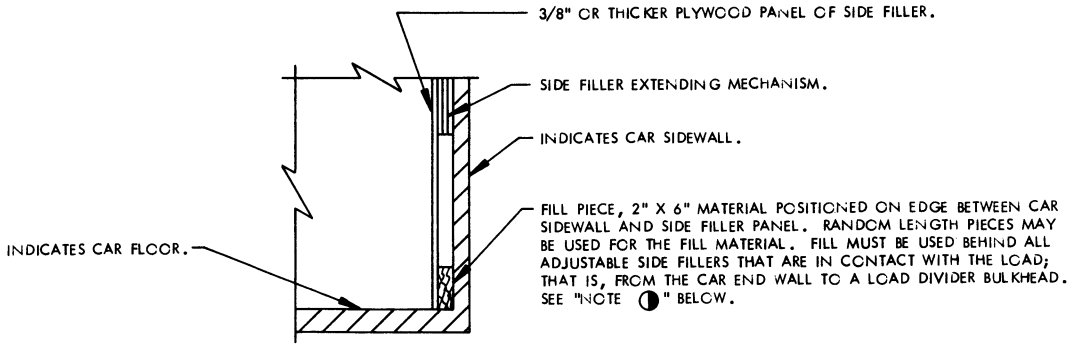


NOTE ▬:

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 CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

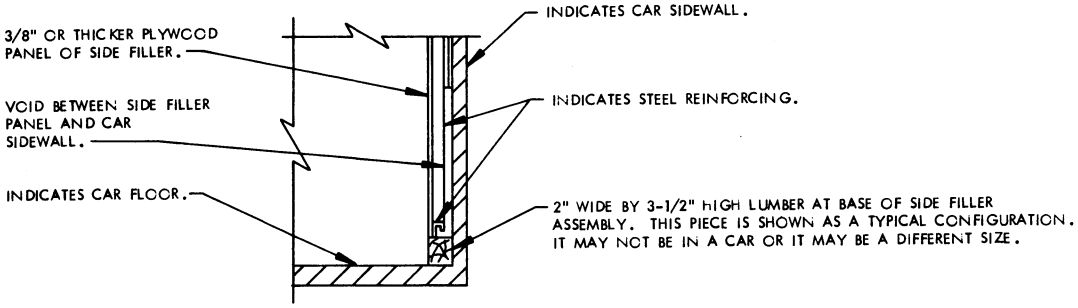


TYPICAL TYPE A

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.