

APPROVED BY
 BUREAU OF EXPLOSIVES
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LOADING AND BRACING (CL & LCL) IN BOX CARS OF PALLETIZED COMPLETE ROUNDS* PACKED IN CYLINDRICAL METAL CONTAINERS M18 SERIES CONTAINER

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* THE OUTLOADING PROCEDURES CONTAINED WITHIN THIS DOCUMENT REFER TO DEMOLITION CRATERING CHARGES.

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.

● LOADS FOR PROTECTIVE COVER AND ROUTED DUNNAGE METHOD UNIT ONLY.

▲ LOAD FOR PROTECTIVE COVER METHOD UNIT ONLY.

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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 UNLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE M18 SERIES COMPLETE ROUND CONTAINERS WITH OR WITHOUT PROTECTIVE COVER UNITIZED ON A 40" X 48" PALLET. SEE THE PICTORIAL VIEWS ON PAGES 4 AND 5. REFER TO THE US ARMY DARGOM (AMC) DRAWING 19-48-4079/11-20PM1002 FOR UNITIZATION PROCEDURES FOR THE M18 SERIES CONTAINER.
- C. THE UNLOADING 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 THAT OVERHANG THE PALLET END 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/OR END WALLS. IF CARS WITH WOOD SIDEWALLS AND/OR END WALLS ARE NOT AVAILABLE, AND ALL STEEL CARS ARE USED, THE SIDEWALLS AND/OR 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 69 FOR GUIDANCE.
- E. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT, IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING, FOR THE QUANTITY TO BE SHIPPED.
- 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 71 FOR GUIDANCE.
- H. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN. HOWEVER, THE DEPICTED UNLOADING 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.

(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.
- STAPLES -----: FED SPEC FF-N-105; Senco QUALITY OR EQUAL.
- STRAPPING, STEEL---: ASTM D 3953; FLAT STRAPPING, TYPE 1 OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.
- SEAL, STRAP -----: ASTM D 3953; CLASS H, FINISH A, B (GRADE 2), OR C, TYPE D, STYLE I, II, OR III.
- STRAP STAPLE-----: COMMERCIAL GRADE.
- PLYWOOD -----: GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC MM-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 -----: ANS1/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 W65 OR STRONGER.

(GENERAL NOTES CONTINUED)

- 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.
- 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. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10D NAIL EVERY 6".
- 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 CARLOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY Senco PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- 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 67 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.
- R. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.
- S. 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.
- T. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- U. LOAD BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS TYPICALLY SHOWN BY PIECES MARKED (7) AND (8) ON PAGE 6. 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.
- V. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREA ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON THE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TORNAILED 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

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(GENERAL NOTES CONTINUED FROM PAGE 2)

- OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 67 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.
- 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

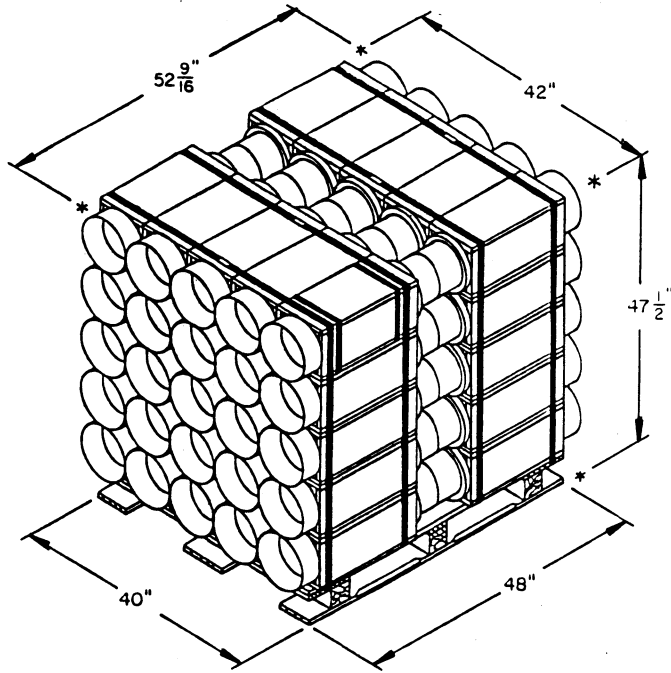
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PREGO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSOQ 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 XLJ.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS 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 STILL 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 77 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 77, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- 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.

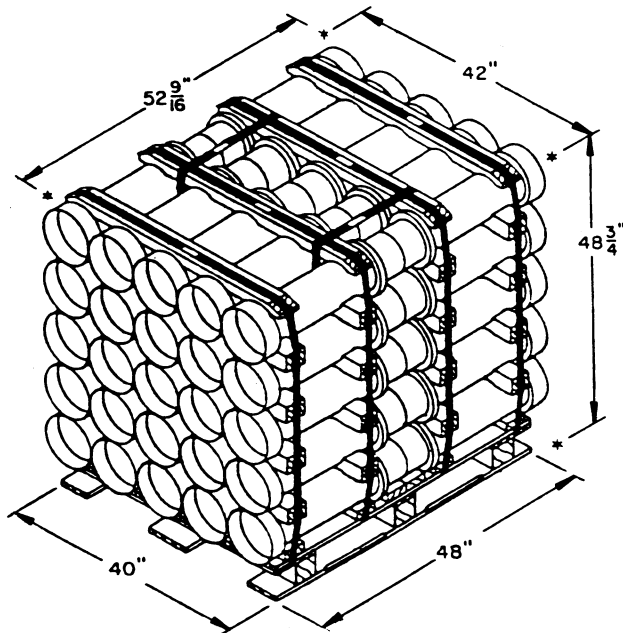
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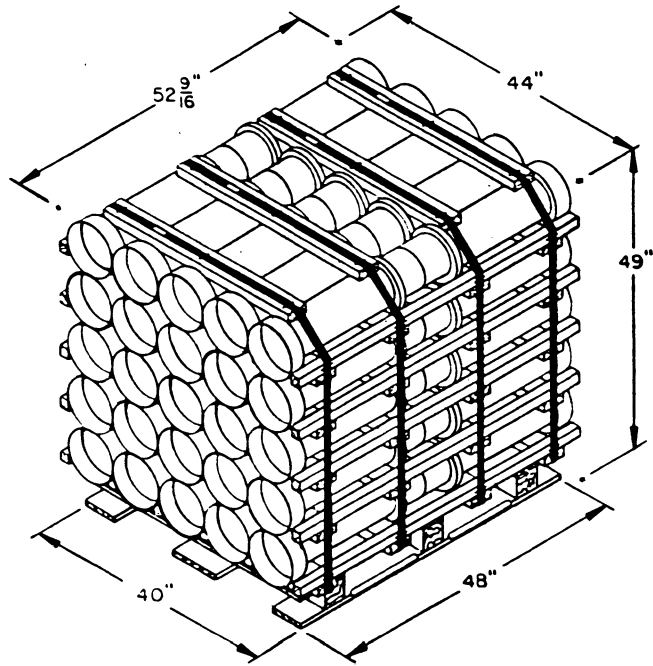
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED BY GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 76.
- 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 PAGE 48 THRU 51.
 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 PAGES 44 AND 45 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. LADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN EVEN LAYERS WHICH ARE ONE 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 LOL BRACES AS SHOWN ON PAGE 62 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGES 58 AND 59.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



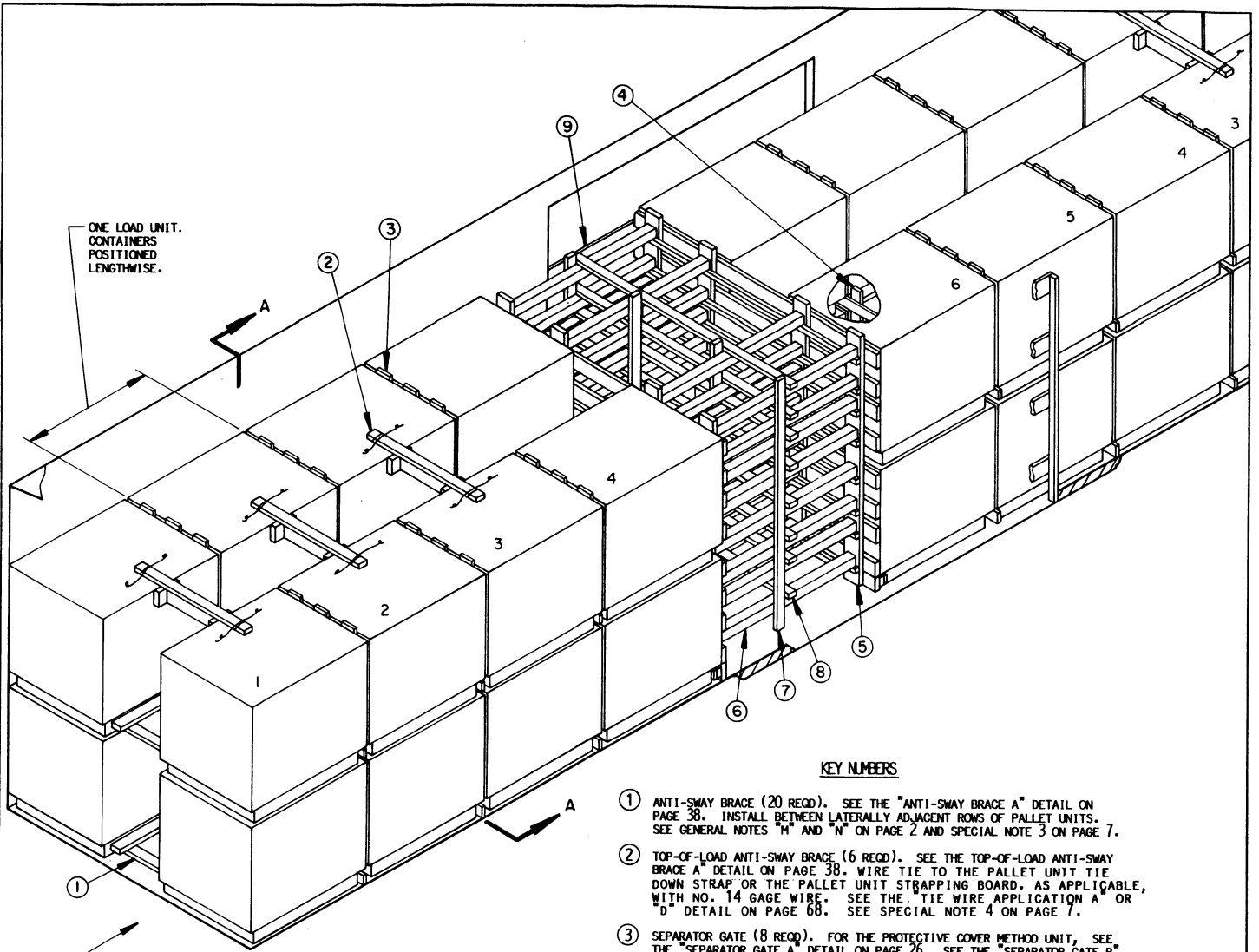
CONTAINER-----50 EACH @ 59 LBS (APPROX)
 CUBE-----60 CUBIC FEET (APPROX)
 GROSS WEIGHT-----3,504 LBS (APPROX)



CONTAINER-----50 EACH @ 59 LBS (APPROX)
 CUBE-----62.3 CUBIC FEET (APPROX)
 GROSS WEIGHT-----3,192 LBS (APPROX)

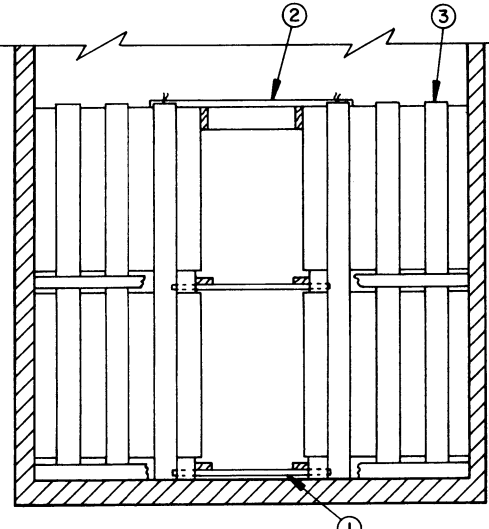


CONTAINER-----50 EACH @ 59 LBS (APPROX)
 CUBE-----65.6 CUBIC FEET (APPROX)
 GROSS WEIGHT-----3,179 LBS (APPROX)



SEE GENERAL NOTES "D" AND "G" ON PAGE 2.

ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO THE PALLET UNIT TIE DOWN STRAP OR THE PALLET UNIT STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION A" OR "D" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 7.
- ③ SEPARATOR GATE (8 REQD). FOR THE PROTECTIVE COVER METHOD UNIT, SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 26. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT OR THE "SEPARATOR GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD UNIT. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 5, 7 AND 8 ON PAGE 7.
- ④ STOP PIECE, 1" x 4" x 56" (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 7.
- ⑤ CENTER GATE (2 REQD). FOR THE PROTECTIVE COVER METHOD UNIT, SEE THE "CENTER GATE A" DETAIL ON PAGE 26, "CENTER GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT OR "CENTER GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD. SEE SPECIAL NOTES 9, 10, 11, AND 16 ON PAGE 7.
- ⑥ STRUT, 4" x 4" BY CUT TO FIT (REF: 68") (32 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ⑦ VERTICAL STRUT BRACING, 2" x 4" x 7'-11" FOR THE PROTECTIVE COVER METHOD UNIT, 2" x 4" x 7'-9" FOR THE ROUTED DUNNAGE METHOD UNIT AND THE FLAT DUNNAGE METHOD UNIT (4 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.
- ⑧ HORIZONTAL STRUT BRACING, 2" x 4" x BY CAR WIDTH MINUS 8" (8 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS W/12D NAILS. SEE SPECIAL NOTES 3 AND 12 ON PAGE 7.

ALL UNITS
40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

(SPECIAL NOTES CONTINUED)

NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

13. 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 40 THRU 62 FOR GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.
15. IF SHIPPING PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS, REFER TO PAGE 64.
16. WHEN SPLIT GATES ARE TO BE USED IN A LOAD AND THE GATES ARE COMPLETELY WITHIN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING WITHIN THE DOORWAY, THE SPLIT GATES MUST BE MODIFIED AS SHOWN BY THE PHANTOM LINES ON THE APPLICABLE CENTER GATE. THE DESIGNATED HORIZONTAL PIECES WILL BE EXTENDED TOWARD THE CENTER OF THE CAR WIDTH APPROXIMATELY 6". TO PREVENT THE SPLIT GATES FROM ENTERING THE DOOR OPENING, DOUBLED 2" X 4" BY A LENGTH TO SUIT PIECES WILL BE POSITIONED SO AS TO BE IN CONTACT WITH THE PALLET UNITS AND NAILED TO THESE EXTENSIONS. FOR A 1-HIGH LOAD, EXTEND THE 2 TOP HORIZONTAL PIECES OF THE CENTER GATE.
17. THE SPECIFIED LOAD LIMIT FOR THOSE FULL-LOAD QUANTITIES LISTED IN SPECIAL NOTE 2 WHICH ARE DIVISIBLE BY EIGHT ARE BASED ON THE USE OF AN OFFSET LOADING PATTERN A CAR HAVING A LESSER LOAD LIMIT MAY BE USED IF AN EQUAL NUMBER OF LOAD UNITS ARE POSITIONED IN EACH END OF THE CAR. THE REQUIRED LOAD LIMIT WILL THEN BE THE SUM OF THE SPECIFIED LADING WEIGHT FOR THE UNIT BEING LOADED AND THE DUNNAGE WEIGHT FOR THE LOAD. APPROXIMATELY 1,900 POUNDS OF DUNNAGE IS REQUIRED FOR A LOAD IN A 40' CAR AND APPROXIMATELY 2,600 POUNDS FOR A 60' LONG CAR.

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. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 6 IS THE PROTECTIVE COVER METHOD UNIT. THE PROCEDURES ON PAGE 6 AND THE SPECIAL NOTES ON THIS PAGE APPLY TO ALL UNITS COVERED WITHIN THIS DRAWING. THE QUANTITY OF UNITS BEING SHIPPED MAY BE LIMITED DUE TO THE WEIGHT OF THE UNIT. SEE THE CHART BELOW FOR GUIDANCE.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	NO. OF LAYERS	STRUT LENGTH	APPROX WEIGHT (LBS)	* LOAD LIMIT (LBS)
PROTECTIVE COVER UNIT	60'-8"	26	1	33"	91,104	92,800
	60'-8"	48	2	6'-11"	168,192	174,200
	50'-6"	40	2	68"	140,160	146,100
	40'-6"	28	2	9'-0"	98,112	103,600
	40'-6"	32	2	55"	112,128	117,900
ROUTED DUNNAGE UNIT	60'-8"	26	1	33"	82,992	84,700
	60'-8"	48	2	6'-11"	153,216	158,900
	50'-6"	40	2	68"	127,680	133,300
	40'-6"	28	2	9'-0"	89,376	94,700
	40'-6"	32	2	55"	102,144	107,600
FLAT DUNNAGE UNIT	60'-8"	26	1	33"	82,654	84,400
	60'-8"	48	2	6'-11"	152,592	158,400
	50'-6"	40	2	68"	127,160	132,700
	40'-6"	28	2	9'-0"	89,012	94,100
	40'-6"	32	2	55"	101,728	107,200

* SEE SPECIAL NOTE 17.

3. IF THE NAILED FLOORLINE BLOCKING, SPACER ASSEMBLY, AND DOORWAY PROTECTION STRAPPING METHOD OF DOORWAY PROTECTION AS SHOWN IN THE LOAD ON PAGE 20 IS USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ①, NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR. 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 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 OF A CAR EQUIPPED WITH SLIDING DOORS 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. STOP PIECES ARE NOT REQUIRED IN CARS EQUIPPED WITH PLUG DOORS.
7. WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE SEPARATOR GATES ADJACENT TO THE NAILED BLOCKING MUST BE MODIFIED FOR A 2-HIGH LOAD, SEE THE SEPARATOR GATE "D", "E" OR "F" DETAIL ON PAGE 29, 30 OR 31, RESPECTIVELY. FOR A 1-HIGH LOAD, SEE THE SEPARATOR GATE "K", "L" OR "M" DETAIL ON PAGE 37 AS APPLICABLE FOR THE UNIT BEING SHIPPED. THE USE OF THIS MODIFIED GATE WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.
8. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 71 FOR CONSTRUCTION GUIDANCE.
9. CENTER GATES 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 72 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", "B" OR "C", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 6, INSTALL TWO (2) CENTER GATES "G", "H" OR "J", AS APPLICABLE, AND AS DETAILED ON PAGES 32 AND 33. 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 72. SEE SPECIAL NOTE 16.
11. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE 1" X 4" AND 2" X 4" MATERIAL NAILED TO THE CENTER GATE, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS, SEE THE DETAILS ON PAGE 70 FOR GUIDANCE.
12. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑥ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 73 THRU 75 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑦ THRU ⑩ ON PAGE 20 OR THE "ALTERNATIVE DOORWAY PROTECTION F" DETAIL ON PAGE 75 FOR GUIDANCE.

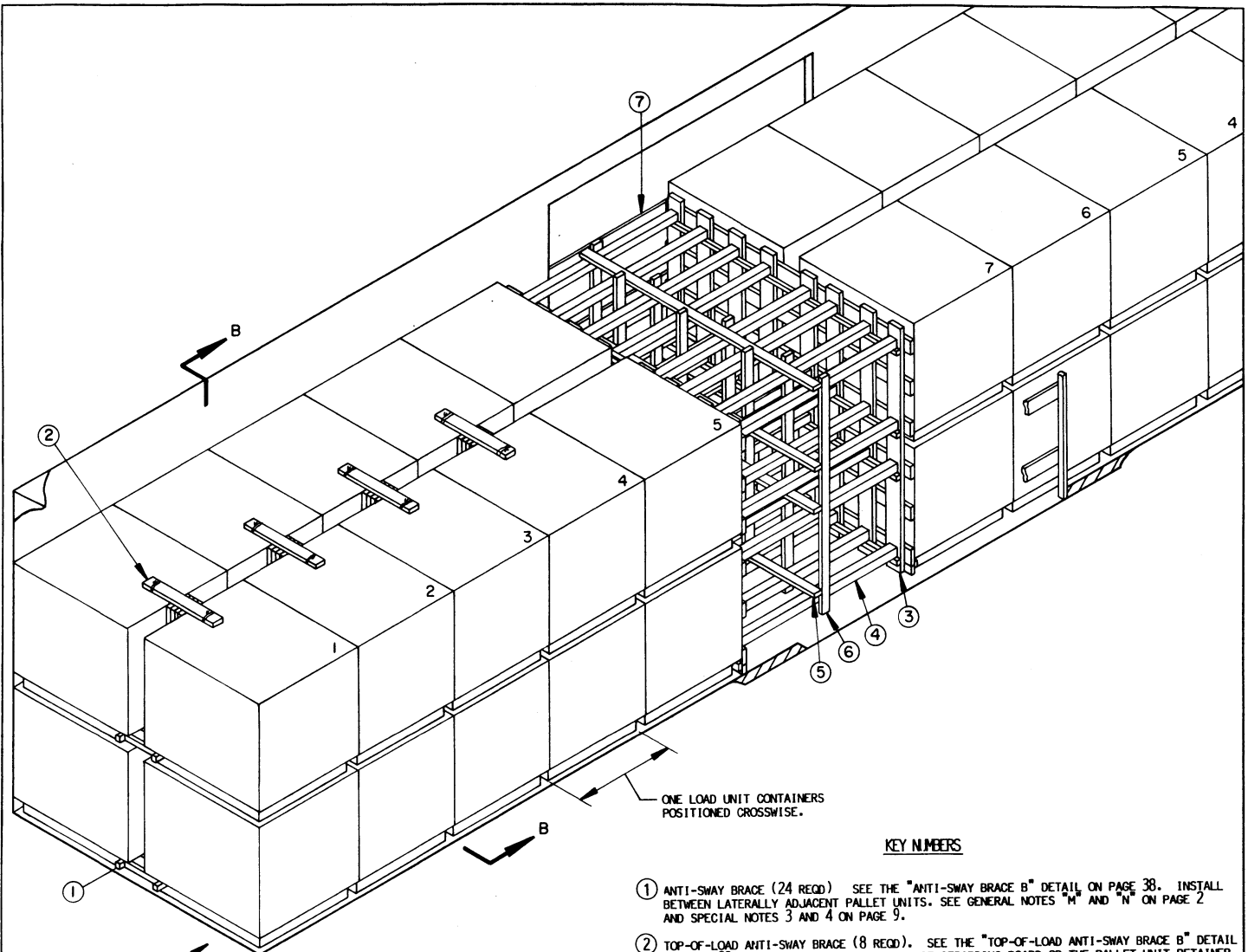
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LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS	40	140,160 LBS
DUNNAGE		2,237 LBS
TOTAL WEIGHT		142,397 LBS (APPROX)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	171	57
1" x 6"	464	232
2" x 5"	139	47
2" x 3"	31	16
2" x 4"	402	268
2" x 6"	245	245
4" x 4"	182	243
NAILS	NO. REQD	POUNDS
6d (2")	390	2-1/4
10d (3")	796	12-1/4
12d (3-1/4")	116	
16d (3-1/2")	128	5
WIRE, NO. 14 GAGE-----60' REQD-----1 LB		

ALL UNITS
40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR



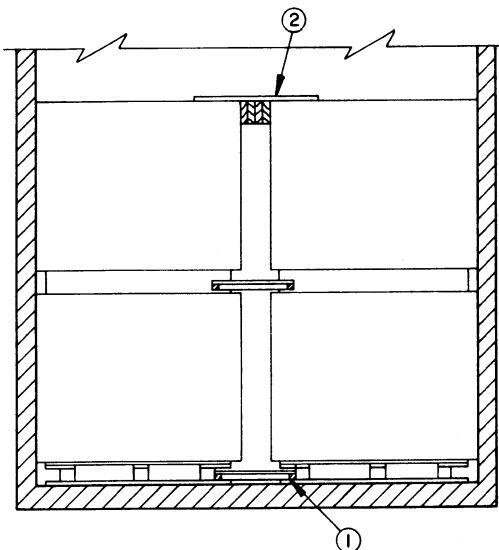
ONE LOAD UNIT CONTAINERS
POSITIONED CROSSWISE.

KEY NUMBERS

- ① ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTES 3 AND 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 38. WIRE TIE TO THE PALLET UNIT STRAPPING BOARD OR THE PALLET UNIT RETAINER STRAP, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION C" OR "B" DETAIL ON PAGE 68. SEE SPECIAL NOTE 5 ON PAGE 9.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 31 FOR THE FLAT DUNNAGE METHOD UNIT, THE "CENTER GATE D" DETAIL ON PAGE 29 FOR THE PROTECTIVE COVER METHOD UNIT AND THE "CENTER GATE E" DETAIL ON PAGE 30 FOR THE ROUTED DUNNAGE METHOD UNIT. SEE SPECIAL NOTES 4, 6, AND 7 ON PAGE 9.
- ④ STRUT, 4" x 4" BY CUT TO FIT (REF: 72" FOR FLAT DUNNAGE METHOD UNIT, 8'-0" FOR THE PROTECTIVE COVER OR ROUTED DUNNAGE METHOD UNIT) (32 REQD); TOENAIL TO PIECES MARKED ③ w/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ⑤ HORIZONTAL STRUT BRACING, 2" x 4" BY CAR WIDTH MINUS 2" (4 REQD). NAIL TO THE STRUTS w/3-10D NAILS AT EACH JOINT.
- ⑥ VERTICAL STRUT BRACING, 2" x 4" x 7'-10" (8 REQD). ALTERNATE PIECES AS SHOWN. NAIL TO THE STRUTS w/3-10D NAILS AT EACH JOINT.
- ⑦ DOORWAY PROTECTION (2 REQD) SEE THE DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS w/12D NAILS. SEE SPECIAL NOTES 3 AND 9 ON PAGE 9.

SEE GENERAL NOTE
6 ON PAGE 2.

ISOMETRIC VIEW



SECTION B-B

ALL UNITS
48-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL 2-LAYER LOAD ON PAGE 8 IS THE FLAT DUNNAGE METHOD UNIT. THE PROCEDURES ON PAGE 8 AND THE SPECIAL NOTES ON THIS PAGE APPLY TO ALL UNITS WITHIN THIS DRAWING. SEE THE CHART BELOW FOR LOAD QUANTITIES, CAR SIZES, AND OTHER GUIDANCE.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	LOAD PATTERN	NO. OF STRUTS	STRUT LENGTH	APPROX. WEIGHT (LBS)	LOAD LIMIT (LBS)
PROTECTIVE COVER	50'-6"	48	7-5	32	8'-0"	168,192	176,200*
	50'-6"	52	7-6	32	54"	182,206	187,100
FLAT DUNNAGE	50'-6"	48	7-5	32	72"	152,592	157,500*
	50'-6"	52	7-6	32	28"	165,308	167,700
	60'-8"	36	7-7	32	8'-10"	178,024	179,900
	60'-8"	60	8-7	48	62"	190,740	193,600
ROUTED DUNNAGE	50'-6"	48	7-5	32	8'-0"	153,216	159,200*
	50'-6"	52	7-6	32	54"	165,984	169,200
	60'-8"	60	8-7	48	7'-8"	191,520	195,000

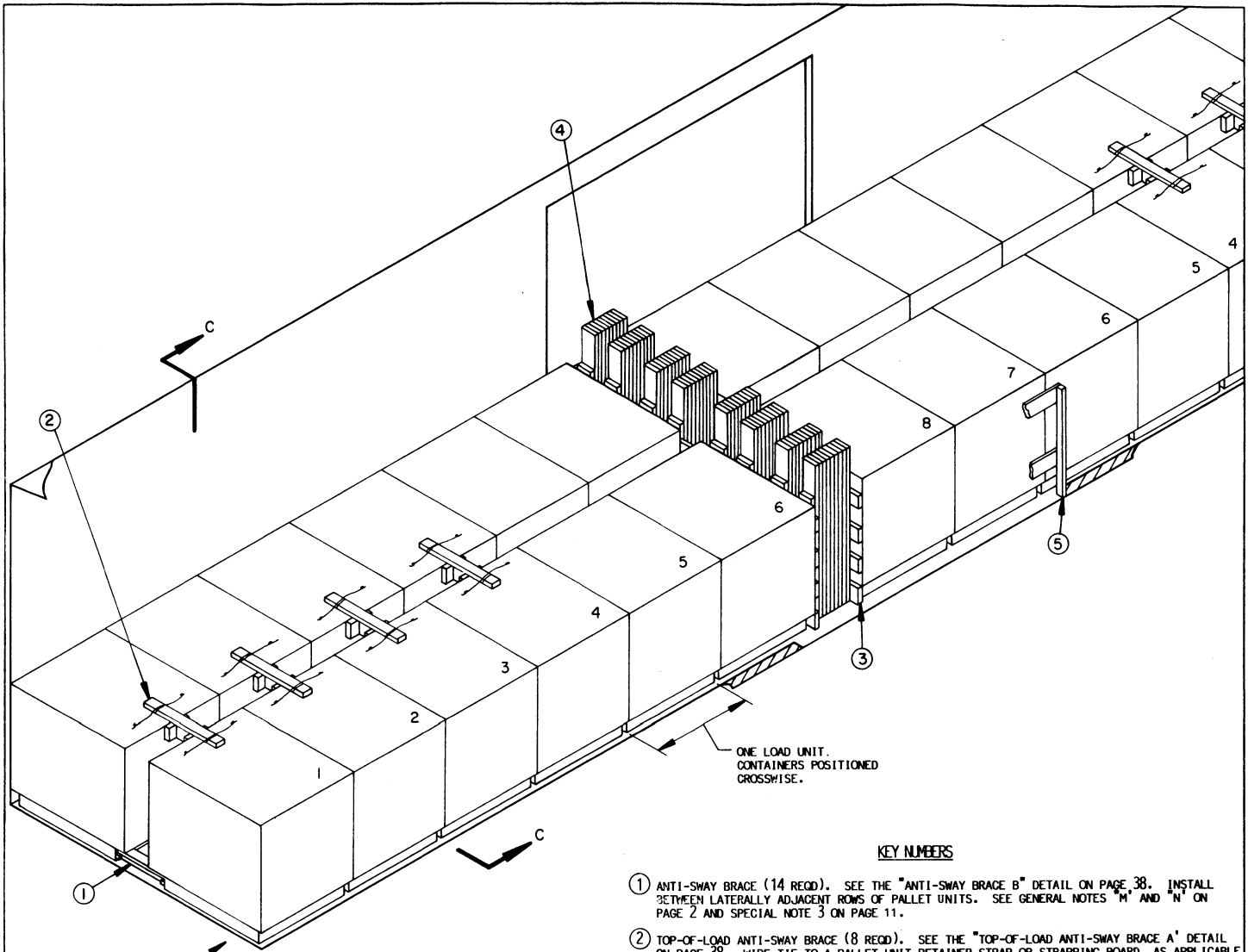
*SEE SPECIAL NOTE 12 BELOW.

3. IF THE NAILED FLOORLINE BLOCKING, SPACER ASSEMBLY, AND DOORWAY PROTECTION STRAPPING METHOD OF DOORWAY PROTECTION AS SHOWN IN THE LOAD ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 IS 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 LENGTH ON EITHER SIDE OF THE CAR.
4. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT LONGITUDINAL DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE. SEE KEY NUMBER ③ ON PAGE 8 FOR REFERENCE TO THE APPLICABLE CENTER GATE DETAIL.
5. 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 A STRAPPING BOARD OR PALLET UNIT RETAINER STRAP, AS APPLICABLE, WITH NO. 14 GAGE WIRE. REGARDLESS OF THE CAR LENGTH OR THE PALLET UNIT BEING SHIPPED, FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF THE CAR. IF A CAR IS WIDER THAN 9'-4", USE "TOP-OF-LOAD ANTI-SWAY BRACE A" AS DETAILED ON PAGE 38. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IN CARS THAT ARE 9'-2" IN WIDTH OR LESS.
6. CENTER GATES 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 72 FOR GUIDANCE.
7. 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 "D", "E", OR "F", SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 8, INSTALL TWO (2) CENTER GATES "K", "L", OR "M", AS APPLICABLE AND AS DETAILED ON PAGES 34 AND 35.
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 LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 73 THRU 75 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ③ THRU ⑧ ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
9. 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 THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHOD OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 40 THRU 62 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 63 AND 66 FOR GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.
12. THE LOAD LIMITS FOR THOSE LOADS LISTED IN SPECIAL NOTE 2 WHICH ARE MARKED WITH AN ASTERISK ARE BASED ON THE USE OF AN OFFSET LOADING PATTERN. A CAR HAVING A LESSER LOAD LIMIT MAY BE USED IF AN EQUAL NUMBER OF LOAD UNITS ARE POSITIONED IN EACH END OF THE CAR. THE REQUIRED LOAD LIMIT WILL THEN BE THE SUM OF THE SPECIFIED LADING WEIGHT FOR THE UNIT BEING LOADED AND THE DUNNAGE WEIGHT FOR THE LOAD. THE DUNNAGE WEIGHT FOR THE 48-UNIT LOADS IS APPROXIMATELY 1,700 POUNDS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	74	25
1" x 4"	80	40
2" x 4"	249	83
2" x 4"	35	18
2" x 4"	213	142
2" x 4"	272	272
4" x 4"	192	256
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/2
10d (3")	1076	16-3/4
12d (3-1/4")	32	3/4
16d (3-1/2")	128	3
WIRE, NO. 14 GAGE-----	80' REQD-----	-1-1/2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	48-----	152,592 LBS
DUNNAGE-----	-----	1,697 LBS
TOTAL WEIGHT-----		154,289 LBS (APPROX)

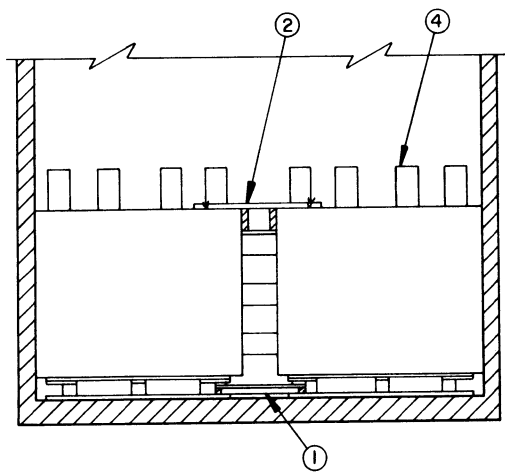


ISOMETRIC VIEW

SEE GENERAL NOTES "D" AND "G" ON PAGE 2.

KEY NUMBERS

- ① ANTI-SWAY BRACE (14 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT RETAINER STRAP OR STRAPPING BOARD, AS APPLICABLE WITH NO. 14 GAGE WIRE. SEE THE TIE WIRE APPLICATION "B" OR "C" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 11.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE N" DETAIL FOR THE PROTECTIVE COVER METHOD UNIT OR THE "CENTER GATE O" DETAIL FOR THE ROUTED DUNNAGE METHOD UNIT ON PAGE 36. SEE SPECIAL NOTE 5 ON PAGE 11.
- ④ SOLID FILL, 6" WIDE BY 58" LONG BY THE THICKNESS REQUIRED TO PROVIDE A WEDGE FIT BETWEEN THE VERTICAL PIECES OF THE LONGITUDINALLY ADJACENT CENTER GATES (REQUIRED AT 8 PLACES). NAIL THE FIRST PIECE TO THE VERTICAL PIECE OF ONE CENTER GATE W/3-10D NAILS. NAIL EACH ADDITIONAL PIECE TO A PREVIOUSLY INSTALLED PIECE W/5-10D NAILS. NAIL THRU EACH EXTENDED VERTICAL PIECE OF THE OTHER CENTER GATE INTO THE LAST SOLID FILL PIECE W/3-10D NAILS.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS W/12D NAILS. SEE SPECIAL NOTE 6 ON PAGE 11.



SECTION C-C

PROTECTIVE COVER METHOD UNIT AND/OR ROUTED DUNNAGE METHOD UNIT
28-UNIT LOAD IN A 50'-6" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-6" 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. THE PALLET UNIT SHOWN IN THE TYPICAL 1-LAYER LOAD ON PAGE 10 IS THE PROTECTIVE COVER METHOD UNIT. THESE PROCEDURES WILL ALSO APPLY TO THE ROUTED DUNNAGE METHOD UNIT. SEE THE CHART BELOW FOR GUIDANCE.

PALLET UNIT	CAR SIZE	NO. OF UNITS	LOAD PATTERN	APPROX WEIGHT (LBS)	LOAD LIMIT (LBS)
PROTECTIVE COVER UNIT	60'-8"	34	9-8	119,136	120,500
	50'-6"	28	8-6	98,112	99,800
	40'-6"	SEE PAGES 14 AND 15			
ROUTED DUNNAGE UNIT	60'-8"	34	9-8	108,528	110,000
	50'-6"	28	8-6	89,376	91,000
	40'-6"	SEE PAGES 14 AND 15			

*SEE SPECIAL NOTE 10 BELOW:

3. IF THE NAILED FLOORLINE BLOCKING, SPACER ASSEMBLY, AND DOORWAY PROTECTION STRAPPING METHOD OF DOORWAY PROTECTION AS SHOWN IN THE LOAD ON PAGE 24 OR BY THE ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 IS USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ⑤, NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLET LENGTH ON EITHER SIDE OF THE CAR.
4. TOP-OF LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH. WHEN LOADING A 9'-4" OR NARROWER CAR, REFER TO THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 68. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED FOR USE IN CARS THAT ARE 9'-2" OR LESS IN WIDTH.
5. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" x 3" MATERIAL NAILED TO A CENTER GATE PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 70 FOR GUIDANCE.
6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 10, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 73 THRU 75 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, SPACER ASSEMBLIES, AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ③ THRU ⑧ ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
7. TO REDUCE A LOAD, SEE THE "TYPICAL COMBINATION LOAD PATTERN PLAN VIEW" ON PAGE 40 AND THE TYPICAL LCL LOAD PROCEDURES ON PAGE 45 AND 52 THRU 62 FOR GUIDANCE. IF THE DEPICTED LOAD IS TO BE REDUCED BY OMITTING A LOAD UNIT, REFER TO PIECES MARKED ③ THRU ⑥ IN THE LOAD ON PAGE 8 FOR GUIDANCE.
8. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 63 AND 66 FOR SHIPPING GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.
10. THE LOAD LIMITS FOR THOSE LOADS LISTED IN SPECIAL NOTE 2 WHICH ARE MARKED WITH AN ASTERISK ARE BASED ON THE USE OF AN OFFSET LOADING PATTERN. A CAR HAVING A LESSER LOAD LIMIT MAY BE USED IF AN EQUAL NUMBER OF LOAD UNITS ARE POSITIONED IN EACH END OF THE CAR. THE REQUIRED LOAD LIMIT WILL THEN BE THE SUM OF THE SPECIFIED LADING WEIGHT FOR THE UNIT BEING LOADED AND THE DUNNAGE WEIGHT FOR THE LOAD. THE DUNNAGE WEIGHT FOR THE 28-UNIT LOAD IS APPROXIMATELY 1,250 POUNDS.

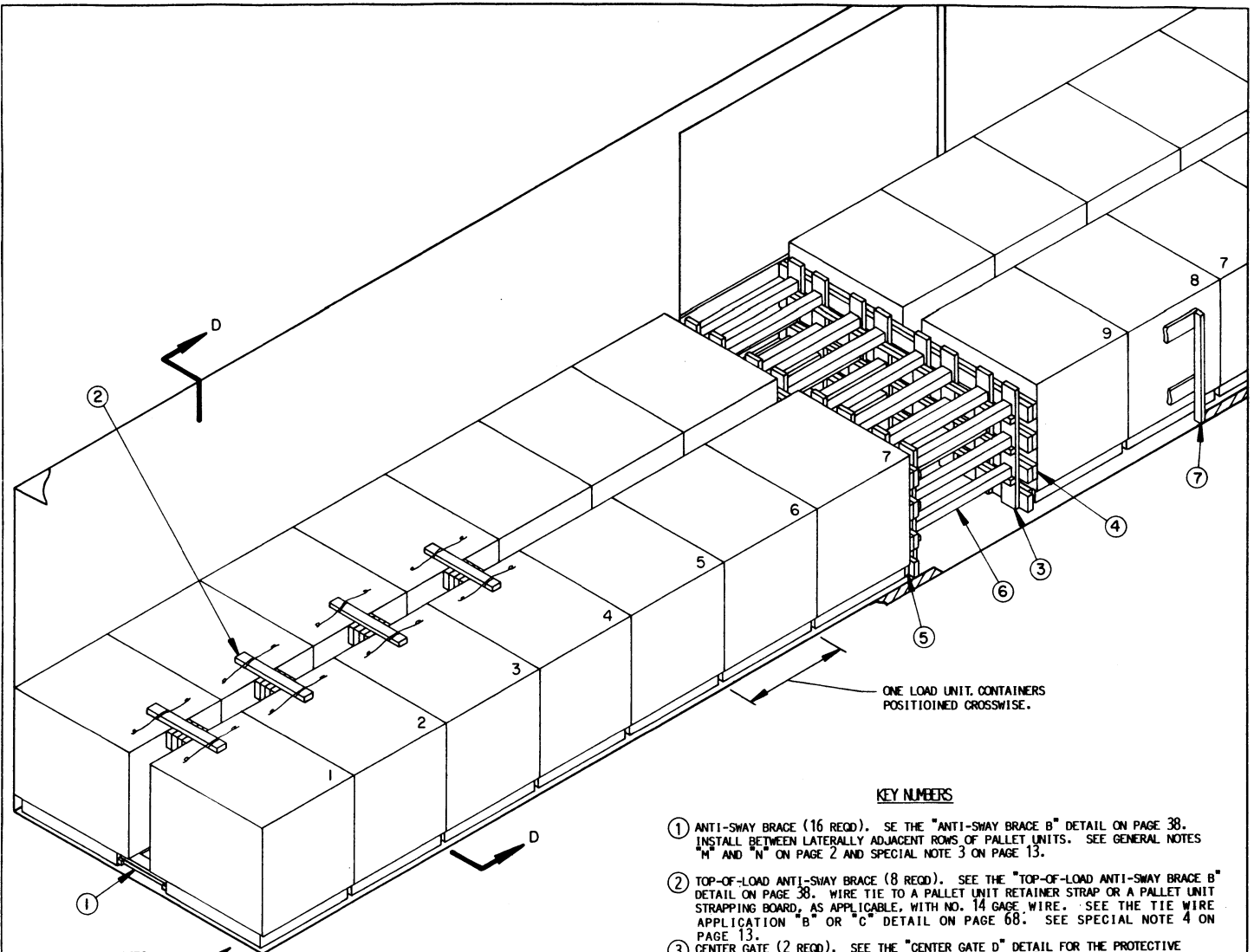
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	48	16
1" x 6"	40	20
2" x 2"	98	33
2" x 3"	22	11
2" x 4"	77	52
2" x 6"	484	484
NAILS	NO. REQD	POUNDS
6d (2")	220	1-1/2
10d (3")	672	10-1/2
12d (3-1/4")	124	2-1/4
WIRE, NO. 14 GAGE	80' REQD	1-1/2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	28	98,112 LBS
DUNNAGE		1,247 LBS
TOTAL WEIGHT		99,359 LBS (APPROX)

PROTECTIVE COVER METHOD UNIT AND/OR ROUTED DUNNAGE METHOD UNIT
28-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



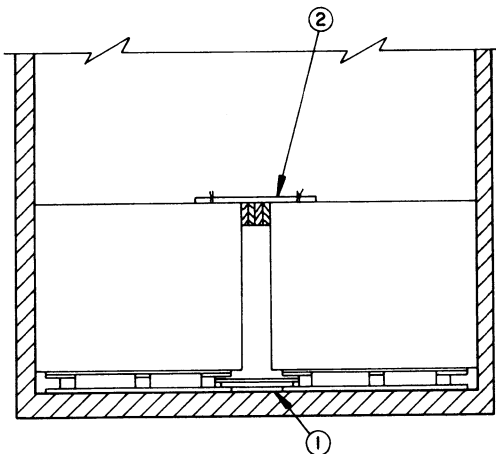
SEE GENERAL NOTES
"D" AND "G" ON PAGE 2.

ISOMETRIC VIEW

ONE LOAD UNIT, CONTAINERS
POSITIONED CROSSWISE.

KEY NUMBERS

- ① ANTI-SWAY BRACE (16 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 13.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT RETAINER STRAP OR A PALLET UNIT STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE TIE WIRE APPLICATION "B" OR "C" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 13.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL FOR THE PROTECTIVE COVER METHOD UNIT ON PAGE 29 OR THE "CENTER GATE E" DETAIL FOR THE ROUTED DUNNAGE METHOD UNIT ON PAGE 30. SEE SPECIAL NOTES 5 THRU 8 ON PAGE 13.
- ④ FILL PIECE, 2" x 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (6 REQD, 3 PER GATE). NAIL TO THE CAR WIDTH HORIZONTAL PIECES OF THE CENTER GATE W/1-10D NAIL EVERY 12". SEE SPECIAL NOTE 6 ON PAGE 13.
- ⑤ FILL PIECE, 2" x 6" x 18" (4 REQD, 2 PER GATE). NAIL TO THE BOTTOM HORIZONTAL PIECES W/3-10D NAILS. SEE SPECIAL NOTE 6 AND THE "VIEW A" DETAIL ON PAGE 13.
- ⑥ STRUT, 4" x 4" BY CUT TO FIT (REF: 47") (24 REQD). JOE NAIL TO PIECES MARKED ③ W/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS W/12D NAILS. SEE SPECIAL NOTES 3 AND 9 ON PAGE 13.

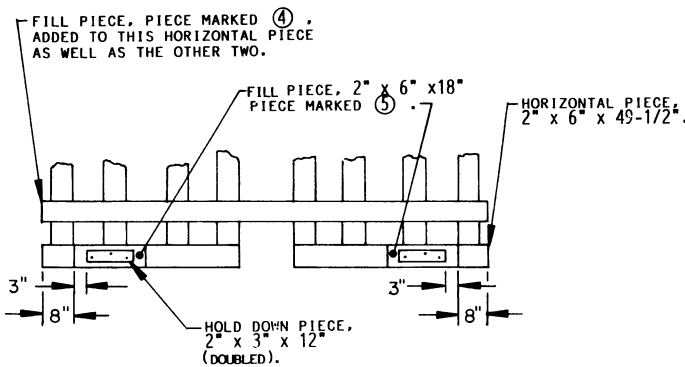


SECTION D-D

PROTECTIVE COVER METHOD UNIT AND ROUTED DUNNAGE METHOD UNIT
32-UNIT LOAD IN A 60'-8" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-4" WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL 1-LAYER LOAD ON PAGE 12 IS THE ROUTED DUNNAGE METHOD UNIT. THESE PROCEDURES ALSO APPLY TO THE PROTECTIVE COVER METHOD UNIT AND ARE ONLY APPLICABLE TO A 60'-8" LONG CAR. THE APPROXIMATE LADING WEIGHT OF THIRTY-TWO (32) PROTECTIVE COVER METHOD UNITS IS 112,128 POUNDS.
3. IF THE NAILED FLOORLINE BLOCKING, SPACER ASSEMBLY, AND DOORWAY PROTECTION STRAPPING METHOD OF DOORWAY PROTECTION AS SHOWN IN THE LOAD ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 IS USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (1), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLETS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLET LENGTH.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 12, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD. WHEN LOADING A CAR WIDER THAN 9'-4", REFER TO "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IN CARS THAT ARE 9'-2" OR LESS IN WIDTH.
5. CENTER GATES 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 72 FOR GUIDANCE.
6. FILL PIECES NAILED TO THE HORIZONTAL PIECES OF CENTER GATE "D" OR "E" AND SHOWN IN THE LOAD ON PAGE 12 AS PIECES MARKED (4) AND (5), ARE REQUIRED TO AVOID THE USE OF VERTICAL AND HORIZONTAL STRUT BRACING. THESE PIECES ARE NOT REQUIRED WHEN THE STRUTS ARE LESS THAN 48". NOTE THAT THE HOLD DOWN PIECES OF CENTER GATE "D" OR "E" MUST BE NAILED TO PIECE MARKED (5). SEE "VIEW A" AT LEFT FOR GUIDANCE.
7. 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 D" OR "CENTER GATE E", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 12, INSTALL TWO (2) "CENTER GATES K OR L" AS SHOWN ON PAGE 34. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION B" DETAIL ON PAGE 72.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO THE CENTER GATE, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 70 FOR GUIDANCE.
9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLET LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (1) IN THE LOAD ON PAGE 12, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 73 THRU 75 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUS TYPE DOORS OR COMBINATION PLUS AND SLIDING DOORS, NAILED FLOORLINE BLOCKING, SPACER ASSEMBLIES, AND DOORWAY PROTECTION STRAPS MUST BE USED. REFER TO PIECES MARKED (3) THRU (8) ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION DETAIL E" ON PAGE 75 FOR GUIDANCE.
10. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, SEE THE PROCEDURES ON PAGE 45. THE DEPICTED LOAD SHOULD NOT BE REDUCED BY OMITTING LOAD UNITS.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 63 AND 66 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.



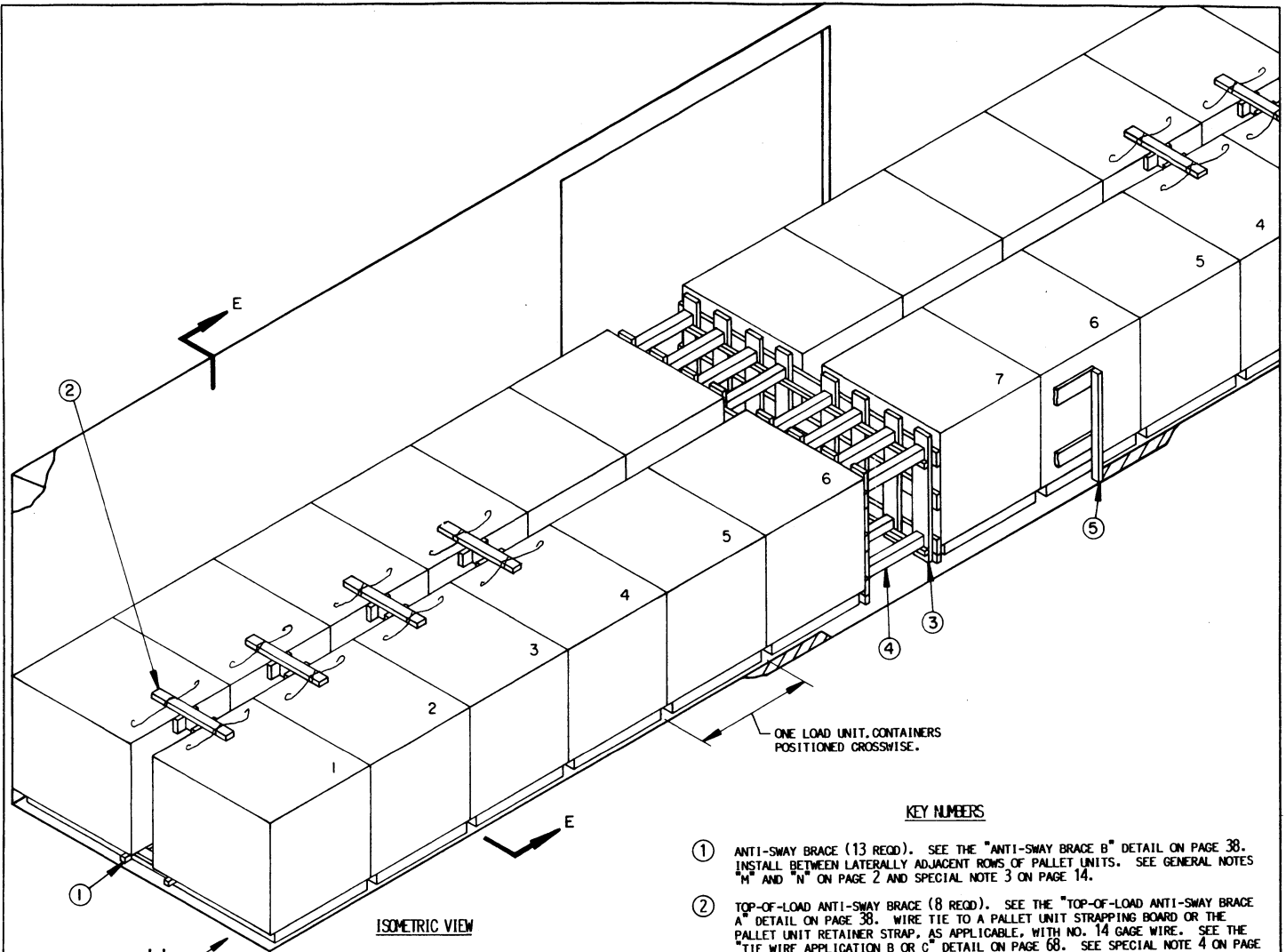
VIEW A

THIS DETAIL SHOWS A PORTION OF "CENTER GATE D" WITH THE ADDED FILL PIECES AS SHOWN IN THE LOAD ON PAGE 12 BY PIECES MARKED (4) AND (5). THIS IS ALSO APPLICABLE FOR FILL PIECES TO BE ADDED TO "CENTER GATE E".

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	49	17
1" x 6"	40	20
2" x 2"	149	50
2" x 3"	22	11
2" x 4"	62	42
2" x 6"	210	210
4" x 4"	94	126
NAILS	NO. REQD	POUNDS
6d (2")	248	1-1/2
10d (3")	526	8-1/4
12d (3-1/4")	12	1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE -----80' REQD ----- 1-1/2 LBS		

ITEM	LOAD AS SHOWN QUANTITY	WEIGHT (APPROX)
PALLET UNIT	32	102,144 LBS
DUNNAGE		966 LBS
TOTAL WEIGHT-----		103,110 LBS (APPROX)

PROTECTIVE COVER METHOD UNIT AND/OR ROUTED DUNNAGE METHOD UNIT
32-UNIT LOAD IN A 60'-8" LONG BY 9'-4" WIDE CONVENTIONAL BOX CAR

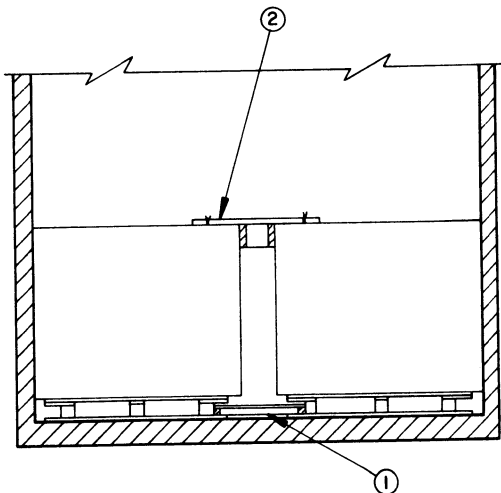


ISOMETRIC VIEW

SEE GENERAL NOTES 'D' AND 'G' ON PAGE 2.

KEY NUMBERS

- ① ANTI-SWAY BRACE (13 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 14.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT STRAPPING BOARD OR THE PALLET UNIT RETAINER STRAP, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION B OR C" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 15.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 31 FOR THE FLAT DUNNAGE METHOD UNIT, THE "CENTER GATE D" DETAIL ON PAGE 29 FOR THE PROTECTIVE COVER METHOD UNIT, AND THE "CENTER GATE E" DETAIL ON PAGE 30 FOR THE ROUTED DUNNAGE METHOD UNIT. SEE SPECIAL NOTES 5, 6, AND 7 ON PAGE 15.
- ④ STRUT, 4" x 4" BY CUT TO FIT (REF: 28" FOR THE FLAT DUNNAGE METHOD UNIT, 54" FOR THE PROTECTIVE COVER OR ROUTED DUNNAGE METHOD UNIT (16 REQD)). TOENAIL TO PIECES MARKED ③, W/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS W/12D NAILS. SEE SPECIAL NOTES 3 AND 8 ON PAGE 15.



SECTION E-E

ALL UNITS

26-UNIT LOAD IN A 50'-5" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-6" 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. THE PALLET UNIT SHOWN IN THE TYPICAL 1-LAYER LOAD ON PAGE 14 IS THE FLAT DUNNAGE METHOD UNIT. THESE PROCEDURES APPLY TO ALL UNITS COVERED BY THIS DRAWING FOR A 1-HIGH LOAD WHEN THE USE OF SOLID FILL BETWEEN THE CENTER GATES OR THE ADDITION OF FILL PIECES TO THE CENTER GATES IS NOT APPROPRIATE. THE SELECTION OF THE PROPER CENTER GATE PROCEDURE WILL BE DEPENDENT ON THE LENGTH OF THE CAR BEING LOADED AND THE PALLET UNIT LENGTH. SEE THE CHART BELOW FOR GUIDANCE.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	LOAD PATTERN	NO. OF STRUTS	STRUT LENGTH	APPROX WEIGHT	LOAD LIMIT
PROTECTIVE COVER	40'-6"	20	6-4	16	60"	70,080	72,600*
	40'-6"	22	6-5	16	18"	77,088	78,200
	50'-6"	24	7-5	16	8'-0"	84,096	87,200
	50'-6"	26	7-6	16	54"	91,104	92,700
	60'-8"	30	8-7	24	7'-8"	105,120	106,900
	60'-8"	32	SEE PAGES 12 AND 13.				
FLAT DUNNAGE	40'-6"	18	5-4	16	7'-0"	57,222	59,200
	40'-6"	20	6-4	16	40"	63,580	65,400
	50'-6"	24	7-5	16	72"	76,296	78,700
	50'-6"	26	7-6	16	28"	82,654	83,800
	60'-8"	28	8-6	24	8'-10"	89,012	91,700
	60'-8"	30	8-7	24	62"	95,370	96,800
60'-8"	32	9-7	24	18"	101,728	102,900	
ROUTED DUNNAGE	40'-6"	20	6-4	16	60"	63,840	66,300
	40'-6"	22	6-5	16	18"	70,224	71,300
	50'-6"	24	7-5	16	8'-0"	76,608	79,500
	50'-6"	26	7-6	16	54"	82,992	84,500
	60'-8"	30	8-7	24	7'-8"	95,760	97,500
	60'-8"	32	SEE PAGES 12 AND 13.				

*SEE SPECIAL NOTE 12 BELOW.

3. IF NAILED FLOORLINE BLOCKING, SPACER ASSEMBLY, AND DOORWAY PROTECTION STRAPPING METHOD OF DOORWAY PROTECTION AS SHOWN IN THE LOAD ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75, IS USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLET LENGTH ON EITHER SIDE OF THE CAR.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED REGARDLESS OF THE CAR LENGTH. IF A CAR IS 9'-4" WIDE OR NARROWER, REFER TO THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 38. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IN CARS THAT ARE 9'-2" OR LESS IN WIDTH.
5. CENTER GATES 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 72 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH CENTER GATE "D", "E", OR "F", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 14, INSTALL TWO (2) CENTER GATES "K", "L", OR "M", AS APPLICABLE, AS DETAILED ON PAGES 34 AND 35. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION B" DETAIL ON PAGE 72.
7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE 2" X 3" AND/OR 2" X 4" MATERIAL NAILED TO THE CENTER GATES, PROVIDING THE CAR BEING LOADED HAS AVAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 70 FOR GUIDANCE.
8. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLET LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 14, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 73 THRU 75 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, SPACER ASSEMBLIES, AND DOORWAY PROTECTION STRAPS MUST BE USED. REFER TO PIECES MARKED (3) THRU (8) ON PAGE 24 OR THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 75 FOR GUIDANCE.
9. THE DEPICTED LOAD CAN BE REDUCED BY OMITTING A LOAD UNIT (2 PALLET UNITS) FROM THE CENTER OF THE LOAD. NOTE THAT HORIZONTAL AND VERTICAL STRUT BRACING WILL BE REQUIRED WHEN OMITTING A LOAD UNIT. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 40, 45, AND 54 THRU 62.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 63 AND 66 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.
12. THE LOAD LIMIT FOR THE LOAD MARKED WITH AN ASTERISK, AS WELL AS THE OTHER LOAD QUANTITIES WHICH ARE DIVISIBLE BY FOUR, ARE BASED ON THE USE OF AN OFFSET LOADING PATTERN. A CAR HAVING A LESSER LOAD LIMIT MAY BE USED IF AN EQUAL NUMBER OF LOAD UNITS ARE POSITIONED IN EACH END OF THE CAR.

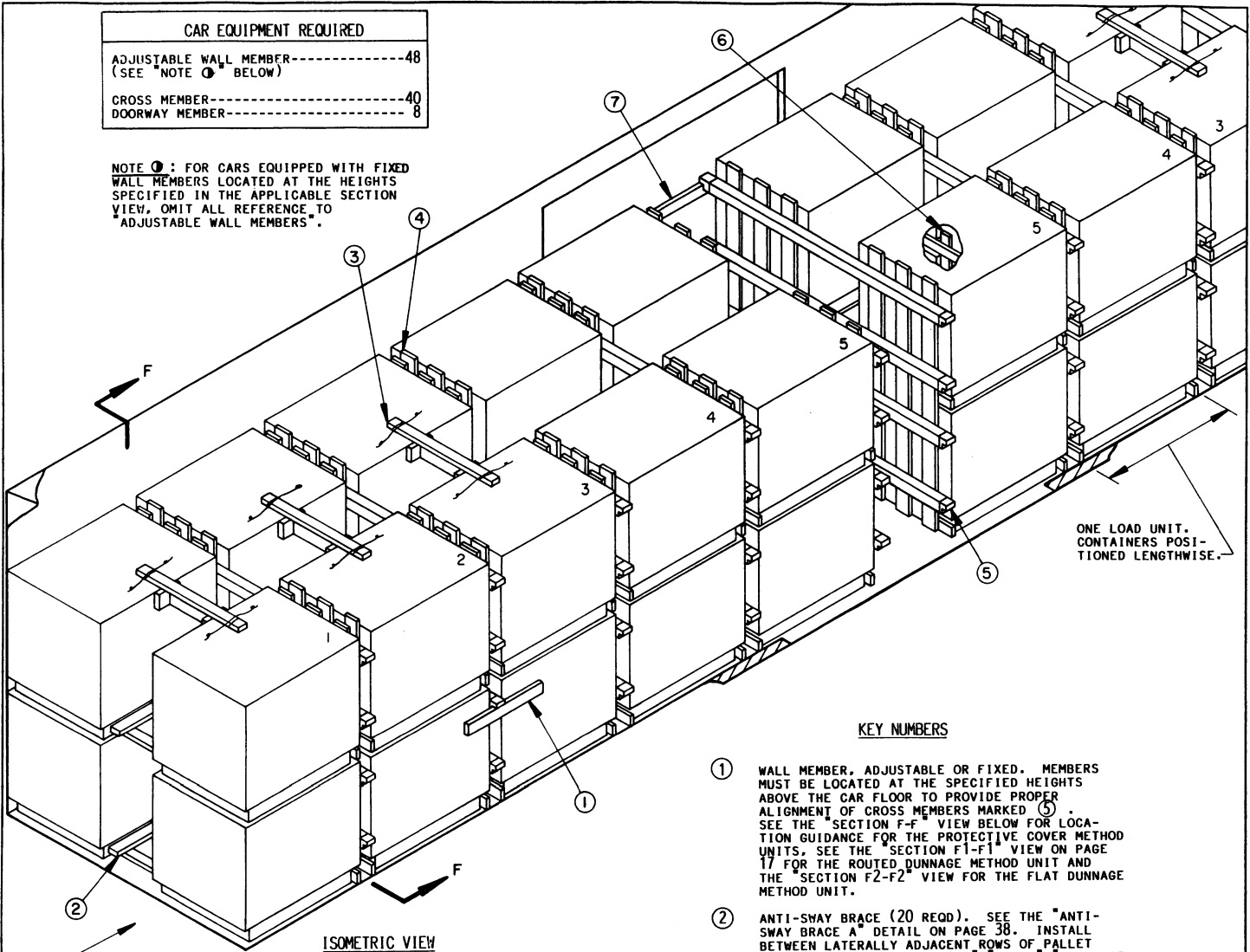
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	44	15
1" x 6"	40	20
2" x 2"	151	51
2" x 3"	18	9
2" x 4"	98	66
2" x 6"	147	147
4" x 4"	38	51
NAILS	NO. REQD	POUNDS
6d (2")	206	1-1/4
10d (3")	424	6-3/4
12d (3-1/4")	124	2-1/4
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	26-----	82,654 LBS
DUNNAGE-----	-----	732 LBS
TOTAL WEIGHT-----		83,386 LBS (APPROX)

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER-----	48
(SEE NOTE 1 BELOW)	
CROSS MEMBER-----	40
DOORWAY MEMBER-----	8

NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN THE APPLICABLE SECTION VIEW, OMIT ALL REFERENCE TO ADJUSTABLE WALL MEMBERS.



ISOMETRIC VIEW

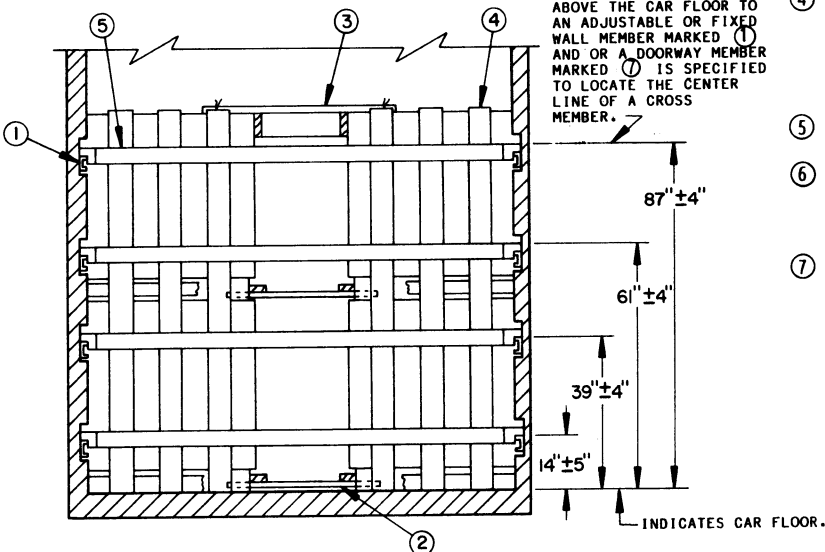
ONE LOAD UNIT. CONTAINERS POSITIONED LENGTHWISE.

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 F-F" VIEW BELOW FOR LOCATION GUIDANCE FOR THE PROTECTIVE COVER METHOD UNITS. SEE THE "SECTION F1-F1" VIEW ON PAGE 17 FOR THE ROUTED DUNNAGE METHOD UNIT AND THE "SECTION F2-F2" VIEW FOR THE FLAT DUNNAGE METHOD UNIT.
- 2 ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. 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 "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT TIEDOWN STRAP OR A PALLET UNIT STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE TIE WIRE APPLICATION "A" OR "D" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 17.
- 4 SEPARATOR GATE (18 REQD). FOR THE PROTECTIVE COVER UNIT, SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 26. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT AND THE "SEPARATOR GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD UNIT. SEE SPECIAL NOTES 5 AND 7 ON PAGE 17.
- 5 CROSS MEMBER (40 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 STOP PIECE, 1" x 4" x 56" (4 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE TIE PIECES OF PIECE MARKED 4 W/3-6D NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 17.
- 7 DOORWAY MEMBER (8 REQD). FOR THE PROTECTIVE COVER METHOD UNIT - SEE THE "SECTION F-F" VIEW AT LEFT, SEE THE "SECTION F1-F1" VIEW ON PAGE 17 FOR THE ROUTED DUNNAGE METHOD UNIT AND THE "SECTION F2-F2" VIEW ON PAGE 17 FOR THE FLAT DUNNAGE METHOD UNIT FOR LOCATION GUIDANCE.

SEE GENERAL NOTES D AND G ON PAGE 2, AND SPECIAL NOTE 3 ON PAGE 17.

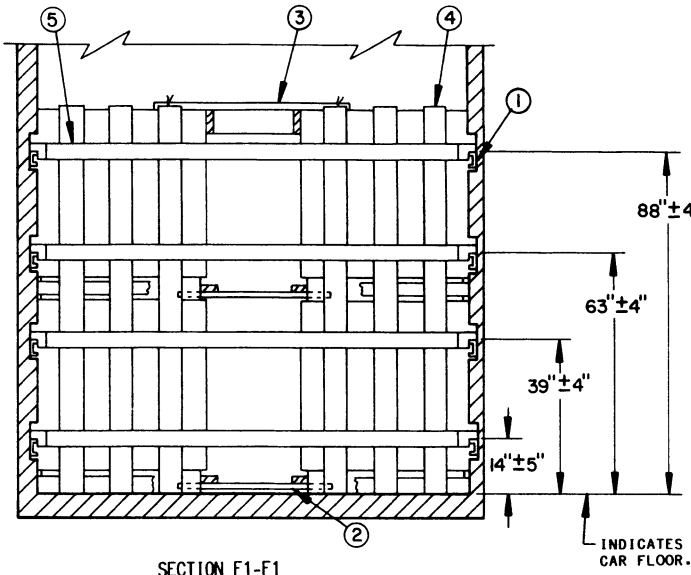
EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED 1 AND OR A DOORWAY MEMBER MARKED 7 IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



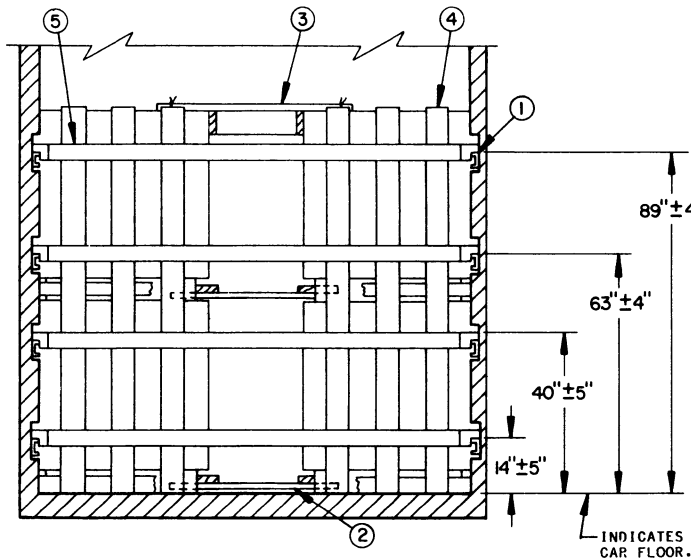
SECTION F-F

ALL UNITS

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



SECTION F1-F1
ROUTED DUNNAGE METHOD UNIT



SECTION F2-F2
FLAT DUNNAGE METHOD UNIT

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. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 16 IS THE PROTECTIVE COVER METHOD UNIT. THE PROCEDURES ON PAGE 16 APPLY TO ALL UNITS COVERED WITHIN THIS DRAWING. SEE THE CHART BELOW FOR GUIDANCE.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	NO. OF LAYERS	APPROX WEIGHT (LBS)
PROTECTIVE COVER	60'-8"	44	2	154,176
	60'-8"	*48	2	*168,192
	50'-6"	40	2	140,160
	40'-6"	28	2	98,112
	40'-6"	32	2	112,128
ROUTED DUNNAGE UNIT	60'-8"	48	2	153,216
	50'-6"	40	2	127,680
	40'-6"	32	2	102,144
FLAT DUNNAGE UNIT	60'-8"	48	2	152,592
	50'-6"	40	2	127,160
	40'-6"	32	2	101,728

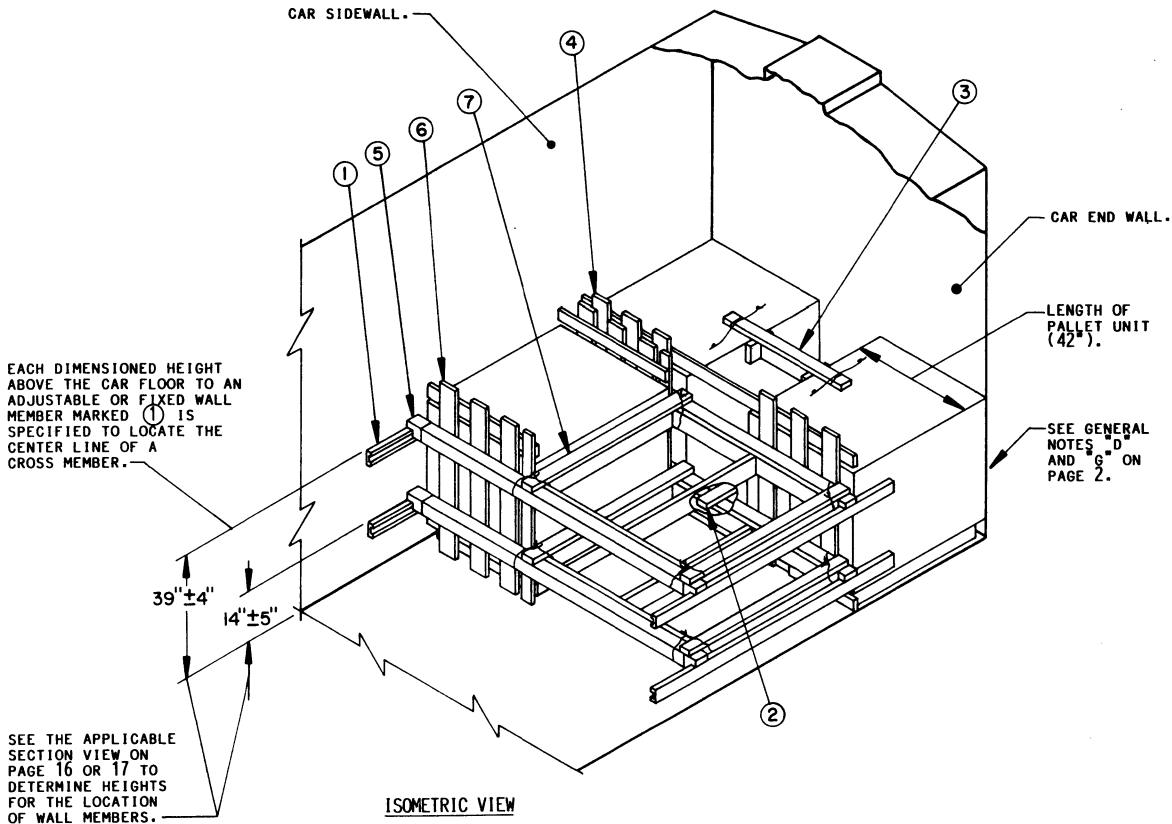
*NOTE: THIS LOAD CAN ONLY BE ACHIEVED IF A LARGE CAPACITY CAR IS AVAILABLE FOR SHIPPING.

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 PIECES MARKED (3) IN THE LOAD ON PAGE 16, MUST BE INSTALLED IN EACH END OF THE CAR. 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 (6). 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" DETAIL ON PAGE 71 FOR CONSTRUCTION GUIDANCE.
8. 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 PAGE 18 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	342	114
1" x 6"	864	432
2" x 4"	281	188
2" x 6"	19	19
NAILS	NO. REQD	POUNDS
6d (2")	672	4
10d (3")	240	3-3/4
12d (3-1/4")	84	1-1/2
WIRE, NO. 14 GAGE-----60'		-----1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----40-----		140,160 LBS
DUNNAGE-----		1,517 LBS
TOTAL WEIGHT-----		141,677 LBS



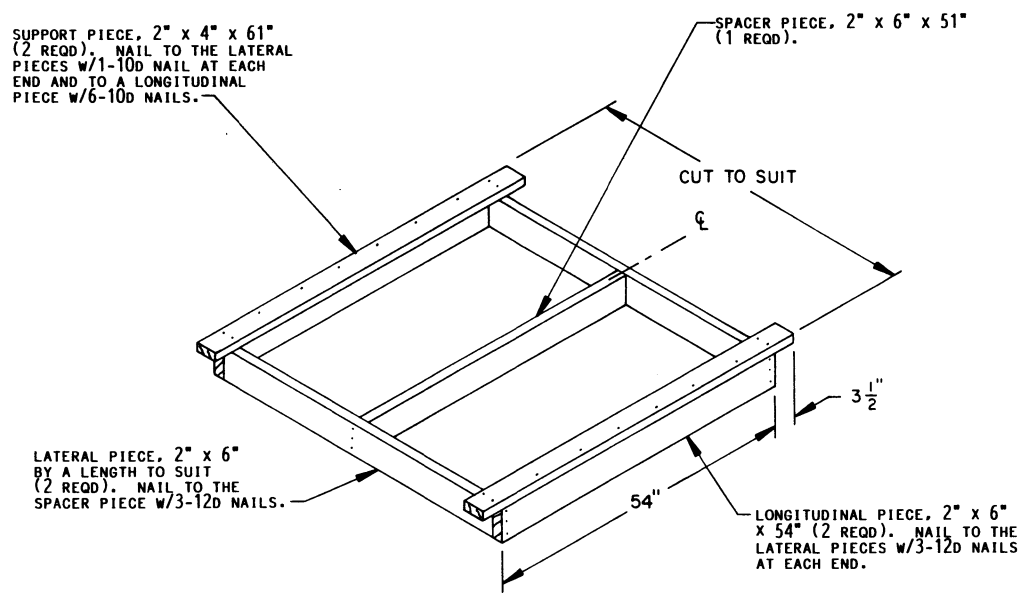
SPECIAL NOTES:

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. THE ROUTED DUNNAGE METHOD UNIT IS SHOWN IN THE TYPICAL LCL LOAD. THE DEPICTED PROCEDURES ARE APPLICABLE FOR ALL UNITS.
3. THREE (3) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. 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. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 71 FOR CONSTRUCTION GUIDANCE.
6. 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 AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10D NAILS. IF THE END WALL IS NON-NAILABLE CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

KEY NUMBERS

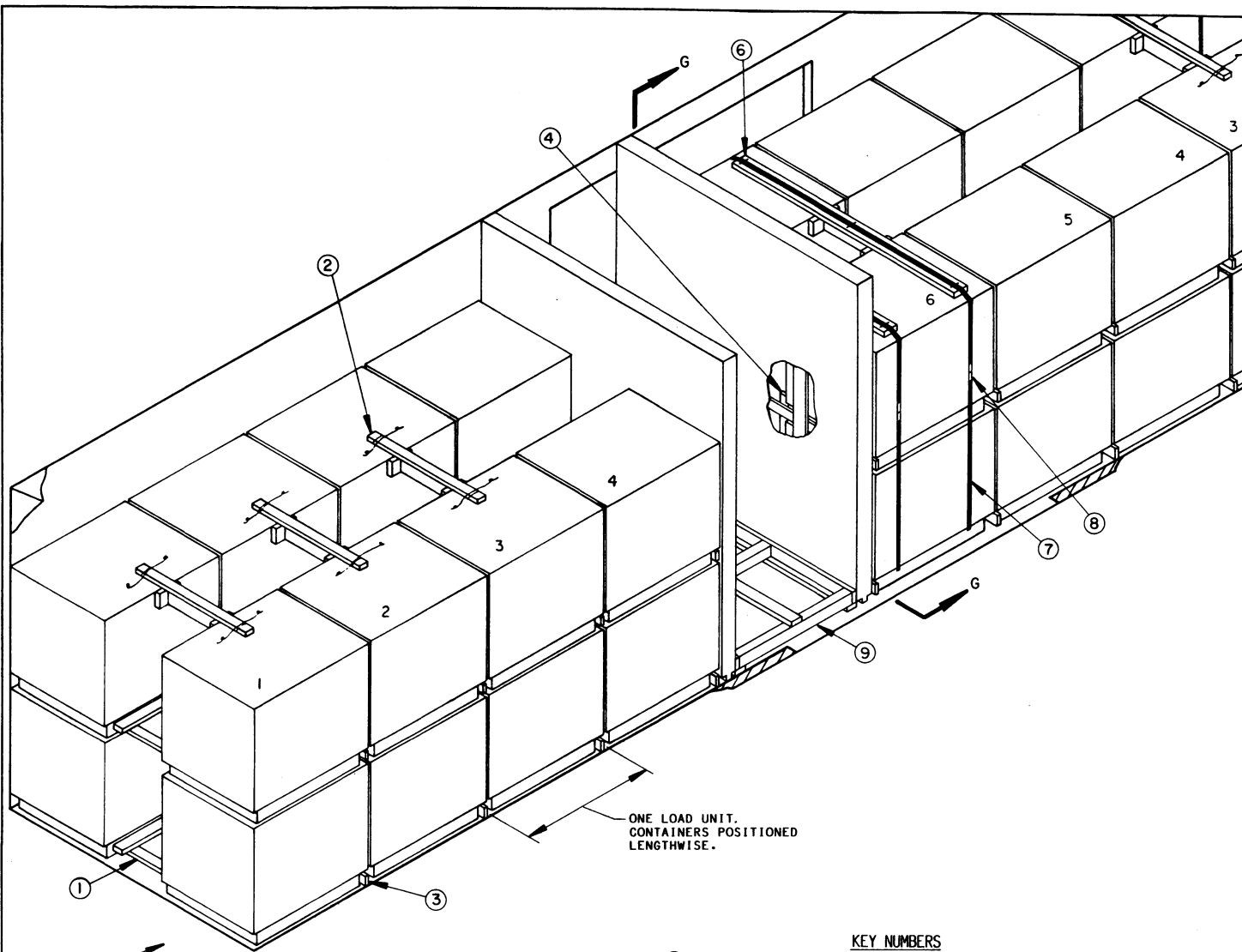
- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② ANTI-SWAY BRACE (1 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO THE PALLET UNIT TIEDOWN STRAP OR THE PALLET UNIT STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE SPECIAL NOTE 4 AT LEFT.
- ④ SEPARATOR GATE FOR 1-HIGH AND 2-WIDE (1 REQD). FOR THE PROTECTIVE COVER METHOD UNIT, SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 26. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT AND THE "SEPARATOR GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD UNIT. POSITION WITH THE 1" X 4" TIE PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑤ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH AND 1-WIDE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). FOR THE PROTECTIVE COVER METHOD UNIT OR THE ROUTED DUNNAGE METHOD UNIT, SEE "SEPARATOR GATE G" OR "H", RESPECTIVELY, ON PAGE 32; FOR THE FLAT DUNNAGE METHOD UNIT, SEE THE "SEPARATOR GATE J" DETAIL ON PAGE 35. POSITION WITH THE 1" X 4" TIE PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 19 AND SPECIAL NOTE 6 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

TYPICAL LCL (3-UNIT LOAD) IN A BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS

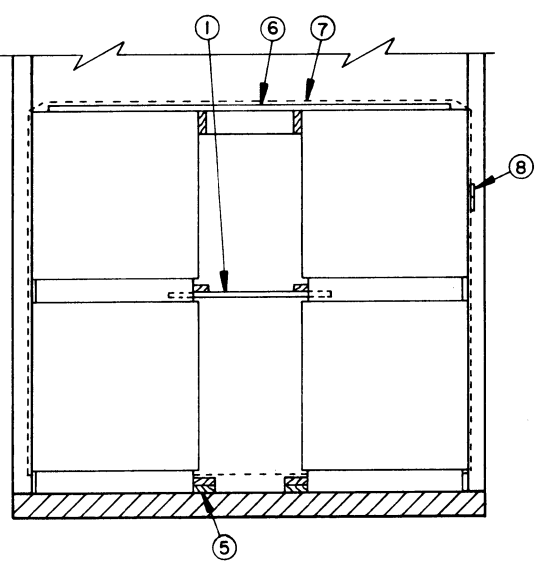


SPACER ASSEMBLY A

TYPICAL LCL (3-UNIT LOAD) IN A BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS



SEE GENERAL NOTES "D" AND "G" ON PAGE 2.
ISOMETRIC VIEW



SECTION G-G

ALL UNITS

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

KEY NUMBERS

- ① ANTI-SWAY BRACE (19 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2, AND SPECIAL NOTE 8 ON PAGE 21.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT TIEDOWN STRAP OR A PALLET UNIT STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION A" OR "D" DETAIL ON PAGE 68. SEE SPECIAL NOTE 3 ON PAGE 21.
- ③ SEPARATOR GATE (10 REQD). FOR THE PROJECTIVE COVER METHOD UNIT, SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 26. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT AND THE "SEPARATOR GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD UNIT. SEE SPECIAL NOTES 4 AND 6 ON PAGE 21.
- ④ STOP PIECE, 1" x 4" x 56" (4 REQD). POSITION AGAINST PALLET UNITS IN THE DOORWAY AREA AND NAIL TO THE HORIZONTAL PIECES OF PIECE MARKED ③ W/3-6D NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 21.
- ⑤ SIDE BLOCKING, 2" x 6" x 48" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 8 ON PAGE 21.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 39 FOR ALL UNITS.
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" x .031" OR .035" x 35'-6" LONG STEEL STRAPPING (2 REQD). STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 9 ON PAGE 21.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 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 76. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 10 ON PAGE 21.

(SPECIAL NOTES CONTINUED)

11. THE SPECIFIED LOAD LIMIT FOR THOSE FULL-LOAD QUANTITIES LISTED IN SPECIAL NOTE 2 WHICH ARE DIVISIBLE BY EIGHT ARE BASED ON THE USE OF AN OFFSET LOADING PATTERN. A CAR HAVING A LESSER LOAD LIMIT MAY BE USED IF AN EQUAL NUMBER OF LOAD UNITS ARE POSITIONED IN EACH END OF THE CAR. THE REQUIRED LOAD LIMIT WILL THEN BE THE SUM OF THE SPECIFIED LADING WEIGHT FOR THE UNIT BEING LOADED AND THE DUNNAGE WEIGHT FOR THE LOAD. APPROXIMATELY 850 POUNDS OF DUNNAGE IS REQUIRED FOR A LOAD IN A 40' CAR, APPROXIMATELY 1,100 POUNDS FOR A 50' CAR, AND APPROXIMATELY 1,250 POUNDS FOR A 60' CAR.
12. 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 40, 41, AND 44 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 64 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.

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. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 20 IS THE ROUTED DUNNAGE METHOD UNIT. THE PROCEDURES ON PAGE 20 APPLY TO ALL UNITS COVERED WITHIN THIS DRAWING. SEE THE CHART BELOW FOR GUIDANCE. REFER TO THE LOAD ON PAGE 22 OR 24 FOR GUIDANCE WHEN THE CONTAINERS ARE POSITIONED CROSSWISE.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	LOAD PATTERN	APPROX WEIGHT(LBS)	* LOAD LIMIT(LBS)
PROTECTIVE COVER	60'-8"	48	7-5	168,192	173,000
	60'-8"	44	6-5	154,176	158,200
	50'-6"	40	6-4	140,160	144,900
	40'-6"	28	4-3	98,112	102,500
	40'-6"	32	5-3	112,128	116,800
ROUTED DUNNAGE UNIT	60'-8"	48	7-5	153,216	157,800
	50'-6"	40	6-4	127,680	132,100
	40'-6"	28	4-3	89,376	93,500
	40'-6"	32	5-3	102,144	106,600
FLAT DUNNAGE UNIT	60'-8"	48	7-5	152,592	157,200
	50'-6"	40	6-4	127,160	131,600
	40'-6"	28	4-3	89,012	93,100
	40'-6"	32	5-3	101,728	106,100

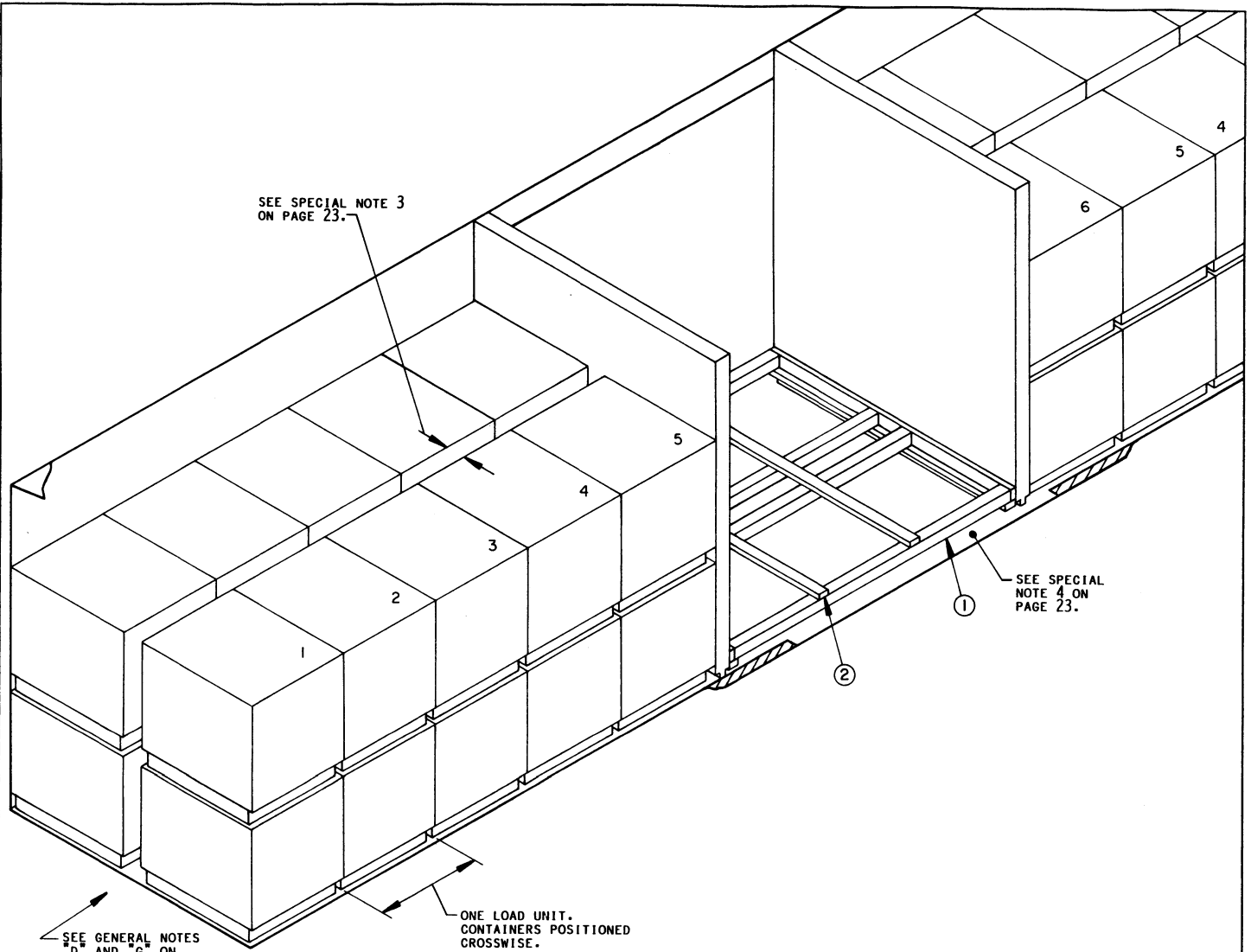
*SEE SPECIAL NOTE 11.

3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 20, MUST BE INSTALLED IN EACH END OF THE CAR. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
4. 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.
5. SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING OF A CAR EQUIPPED WITH SLIDING DOORS 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, STOP PIECES ARE NOT REQUIRED IN CARS HAVING PLUG DOORS.
6. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 71 FOR CONSTRUCTION GUIDANCE.
7. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 6 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS, ⑥ THRU ⑧ ON PAGE 20, MAY BE USED. REFER TO PAGES 73 THRU 75 FOR OTHER TYPES OF DOORWAY PROTECTION.
8. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING, PIECE MARKED ⑤ IN THE LOAD VIEW, MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING BUNDLING STRAPS.
9. TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT WIDTH.
10. A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 76.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	202	68
1" x 6"	480	240
2" x 8"	17	12
2" x 4"	311	208
4" x 6"	63	63
4" x 4"	21	28
NAILS	NO. REQD	POUNDS
6d (2")	402	2-1/2
10d (3")	246	4
12d (3-1/4")	128	2-1/4
16d (3-1/2")	20	1/2
STEEL STRAPPING, 1-1/4" x .031" OR .035"---71' REQD---10 LBS		
SEAL FOR 1-1/4 STRAPPING-----4 REQD---NIL		
STAPLE-----6 REQD---NIL		
WIRE, NO. 14 GAGE-----60' REQD---1 LB		

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	40	127,680 LBS
DUNNAGE		1,259 LBS
TOTAL WEIGHT		128,939 LBS



SEE GENERAL NOTES
D AND G ON
PAGE 2.

ONE LOAD UNIT.
CONTAINERS POSITIONED
CROSSWISE.

ISOMETRIC VIEW

KEY NUMBERS

- ① STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 76. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 6 ON PAGE 23.
- ② STRUT BRACING, 2" x 4" BY LOAD DIVIDER WIDTH (2 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT. SEE SPECIAL NOTE 6 ON PAGE 23.

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 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. SEE SPECIAL NOTE 3.
2. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 22 IS THE PROTECTIVE COVER METHOD UNIT. SEE THE CHART BELOW FOR GUIDANCE IN THE QUANTITIES WHICH CAN BE LOADED IN VARIOUS SIZE CARS, AND THE LOAD LIMITS REQUIRED. REFER TO THE LOAD ON PAGE 20 FOR GUIDANCE WHEN THE CONTAINERS ARE POSITIONED LENGTHWISE IN THE CAR.

CAR LENGTH	NO. OF UNITS	LOAD PATTERN	APPROX WEIGHT(LBS)	LOAD LIMIT(LBS)
60'-8"	48	7-5	168,192	177,000
60'-8"	44	6-5	154,176	159,600
50'-6"	48	6-6	168,192	168,350
50'-6"	44	6-5	154,176	157,600
50'-6"	40	5-5	140,160	140,500
50'-6"	36	5-4	126,144	128,800
40'-6"	40	5-5	140,160	140,400
40'-6"	36	5-4	126,144	129,600
40'-6"	32	4-4	112,128	112,500

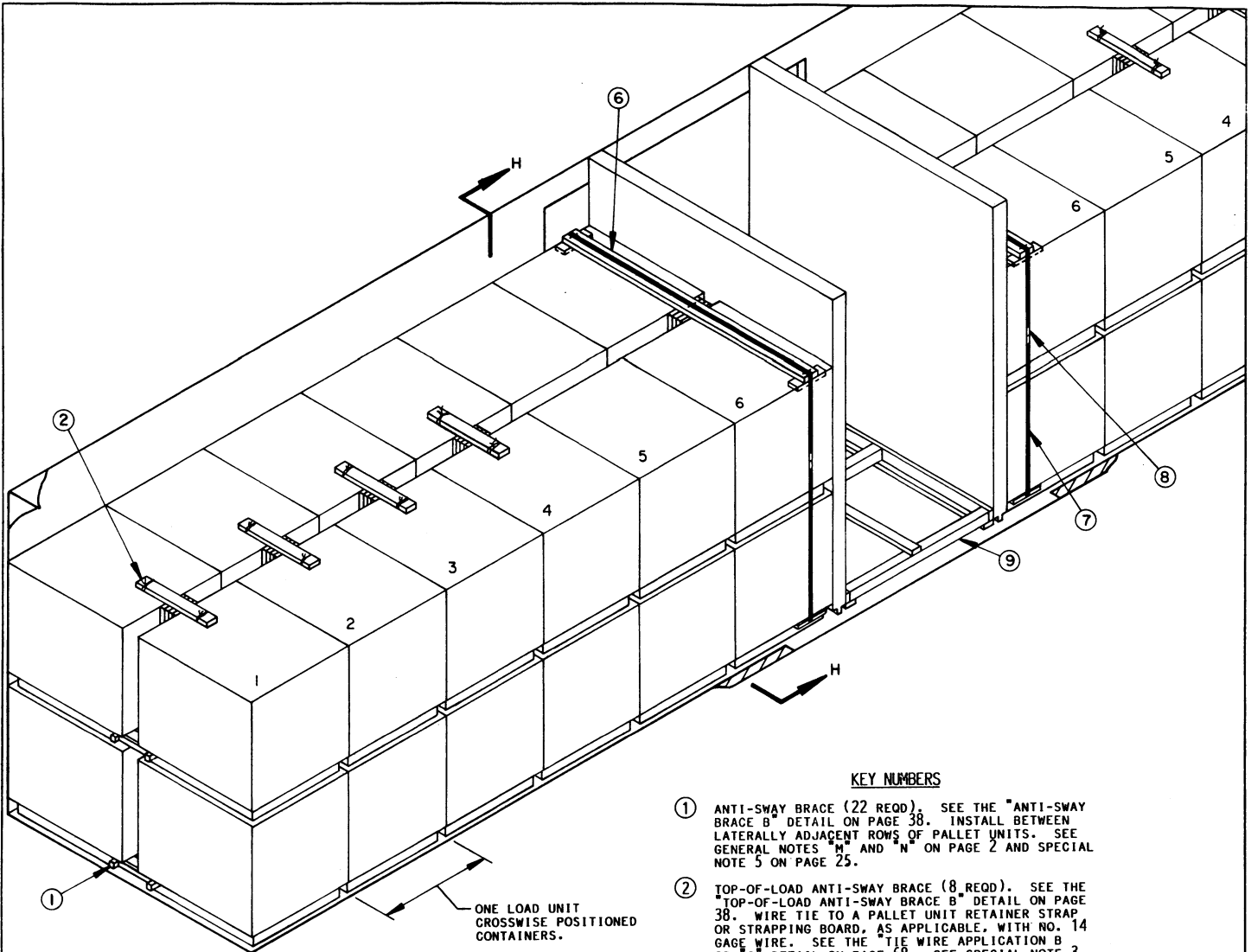
*A 48-UNIT LOAD IN A 60'-8" CAR CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 168,600 POUNDS OR GREATER IF SIX LOAD UNITS ARE PLACED IN EACH END.

3. THE LOAD SHOWN ON PAGE 22 WILL REQUIRE ANTI-SWAY BRACES AND TOP-OF-LOAD ANTI-SWAY BRACES WHEN THE CAR WIDTH IS MORE THAN 9'-2". SEE PIECES MARKED ① AND ② ON PAGE 24 FOR GUIDANCE.
4. WHEN THE LOAD EXTENDS INTO THE DOORWAY AREA, DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE NAILED FLOORLINE BLOCKING AND SPACER ASSEMBLY METHOD OF DOORWAY PROTECTION IS USED IN THE LOAD ON PAGE 24 AND ALSO SHOWN BY THE ALTERNATIVE DOORWAY PROTECTION "E" DETAIL ON PAGE 75. THAT METHOD IS APPLICABLE FOR ANY TYPE DOOR, WHETHER SLIDING, PLUG, OR COMBINATION PLUG AND SLIDING. THE WOODEN GATE TYPE DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 8, MAY BE USED IF THE CAR IS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. REFER TO PAGES 73 THRU 75 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS.
5. WHEN THE LOAD EXTENDS INTO THE DOORWAY AREA OF A CAR EQUIPPED PLUG DOORS, TWO (2) DOORWAY PROTECTION 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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE LOAD UNIT ON BOTH SIDES OF THE CAR.
6. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 22, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY IS REQUIRED IF THE LOAD IN EITHER END OF THE CAR IS MORE THAN THREE (3) LOAD UNITS LONG. IF THE STRUTS OF THE ASSEMBLY ARE LONGER THAN 12'-0", WHICH THEY WILL BE FOR A 44-UNIT LOAD IN A 60'-8" LONG CAR OR FOR A 40-UNIT OR 36-UNIT LOAD IN A 50'-6" CAR, THE STRUTS MUST BE HELD DOWN. SEE THE "STRUT ASSEMBLY HOLD DOWN" DETAILS ON PAGE 78. PIECES MARKED ② WILL THEN NOT BE REQUIRED.
7. IF THE LOAD BEHIND NEITHER LOAD DIVIDER BULKHEAD IS MORE THAN 50,000 POUNDS, PALLET UNITS MAY BE PLACED BETWEEN THE BULKHEADS, IF DESIRED AND PROVIDING THE LOAD LIMIT OF THE CAR IS NOT EXCEEDED. PALLET UNITS WILL BE POSITIONED AGAINST A BULKHEAD AND BRACED EITHER WITH KNEE BRACES AS SHOWN ON PAGE 58 OR WITH LCL BRACES AS SHOWN ON PAGE 62. IF PALLETS ARE LOADED TWO WIDE AND BRACED WITH CENTER GATES AND STRUTS, THE LOADS BEHIND THE BULKHEADS CAN BE GREATER THAN 50,000 POUNDS.
8. 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 PAGE 45 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
9. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 63 AND 66 FOR SHIPPING GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 8"	17	12
2" x 4"	55	37
4" x 4"	44	59
NAILS	NO. REQD	POUNDS
6D (2")	16	1/4
10D (3")	42	3/4
12D (3-1/4")	16	1/2

LOAD AS SHOWN

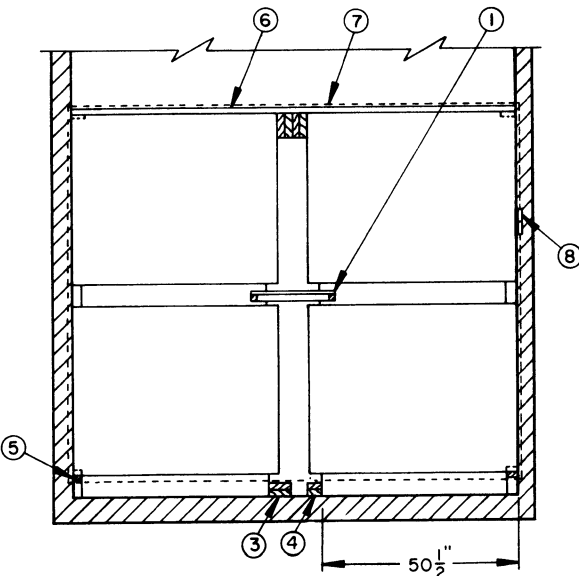
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	44-----	154,176 LBS
DUNNAGE-----		221 LBS
TOTAL WEIGHT-----		154,397 LBS



ISOMETRIC VIEW

SEE GENERAL NOTES
D AND G
ON PAGE 2.

ONE LOAD UNIT
CROSSWISE POSITIONED
CONTAINERS.



SECTION H-H

KEY NUMBERS

- ① ANTI-SWAY BRACE (22 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 25.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 38. WIRE TIE TO A PALLET UNIT RETAINER STRAP OR STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION B OR "C" DETAIL ON PAGE 68. SEE SPECIAL NOTE 3 ON PAGE 25.
- ③ SIDE BLOCKING, 2" x 6" x 42" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.
- ④ SIDE BLOCKING, 2" x 4" x 42" (DOUBLED) (2 REQD). PRE-POSITION ABOUT 50-1/2" FROM THE NEAR SIDE CAR WALL. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER. SEE SPECIAL NOTES 4 AND 5 ON PAGE 25.
- ⑤ BATTEN, 2" x 2-1/2" (ACTUAL SIZE) x 12" OR A LENGTH TO SUIT (4 REQD). POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY D" DETAIL ON PAGE 39 FOR THE FLAT DUNNAGE METHOD UNIT OR THE "SPACER ASSEMBLY C" DETAIL ON PAGE 39 FOR THE ROUTED DUNNAGE OR PROTECTIVE COVER METHOD UNIT.
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" x .031" OR .035" x 36'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 25.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 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 76. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 25.

ALL UNITS

48-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" 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 "FF" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 24 IS THE FLAT DUNNAGE METHOD UNIT. THE PROCEDURES ON PAGE 24 APPLY TO ALL UNITS COVERED WITHIN THIS DRAWING. SEE THE CHART BELOW FOR GUIDANCE. REFER TO THE LOAD ON PAGE 20 FOR GUIDANCE WHEN THE CONTAINERS ARE POSITIONED LENGTHWISE IN THE CAR.

PALLET UNIT	CAR LENGTH	NO. OF UNITS	LOAD PATTERN	APPROX WEIGHT(LBS)	LOAD LIMIT(LBS)
FLAT DUNNAGE	60'-8"	60	8-7	190.740	192.600
	60'-8"	56	7-7	178.024	178.500
	60'-8"	52	7-6	165.308	194.100
	50'-6"	48	7-5	152.592	156.400
	50'-6"	44	6-5	139.876	143.200
	50'-6"	40	6-4	127.160	134.600
	40'-6"	40	5-5	127.160	127.700
	40'-6"	36	5-4	114.444	117.500
40'-6"	32	4-4	101.728	102.100	
PROTECTIVE COVER	60'-8"	60	8-7	210.240	212.700
	60'-8"	56	7-7	196.224	196.700
	50'-6"	52	7-6	182.208	184.400
	50'-6"	48	6-6	168.192	168.600
	50'-6"	44	6-5	154.176	158.000
	40'-6"	36	5-4	126.144	129.100
	40'-6"	32	4-4	112.128	112.600
	40'-6"	28	4-3	98.112	104.100
ROUTED DUNNAGE	60'-8"	60	8-7	191.520	193.800
	60'-8"	56	7-7	178.752	179.200
	50'-6"	52	7-6	165.984	167.800
	50'-6"	48	7-5	153.216	158.000
	50'-6"	44	6-5	140.448	144.000
	40'-6"	40	5-5	127.680	128.100
	40'-6"	36	5-4	114.912	118.400
	40'-6"	32	4-4	102.144	108.100

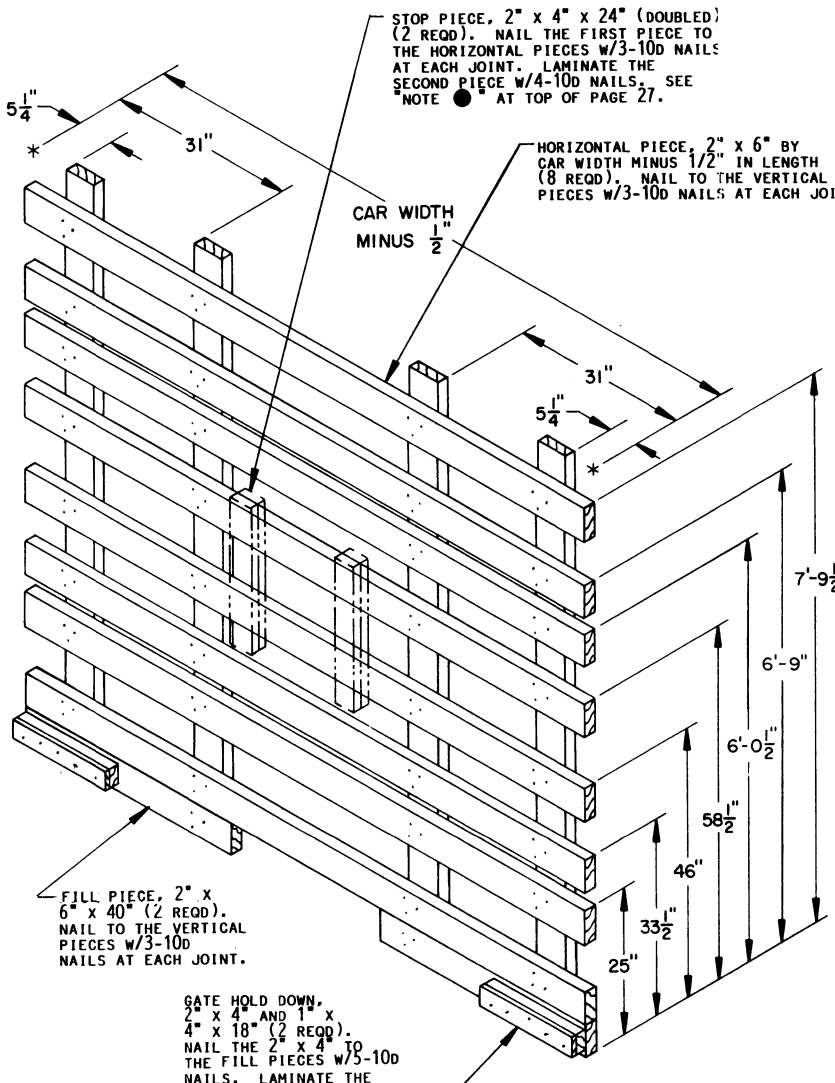
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 24, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD REGARDLESS OF THE CAR LENGTH. IF A CAR IS WIDER THAN 9'-4", REFER TO THE TOP-OF-LOAD ANTI-SWAY BRACE A DETAIL ON PAGE 38. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED IN CARS THAT ARE 9'-2" OR LESS IN WIDTH.
4. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MARKED ③ THRU ⑤ ON PAGE 24, MAY BE USED. REFER TO PAGES 73 THRU 75 FOR OTHER TYPES OF DOORWAY PROTECTION.
5. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILABLE SIDE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SIDE BLOCKING, PIECES MARKED ③ AND ④ IN THE LOAD VIEW MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED ① FOR ALL UNITS REQUIRING BUNDLING STRAPS.
6. TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH.
7. A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 76.
8. IF THE LOAD BEHIND NEITHER LOAD DIVIDER BULKHEAD IS MORE THAN 50,000 POUNDS, PALLET UNITS MAY BE PLACED BETWEEN THE BULKHEADS, IF DESIRED AND PROVIDING THE LOAD LIMIT OF THE CAR IS NOT EXCEEDED. PALLET UNITS WILL BE POSITIONED AGAINST A BULKHEAD AND BRACED EITHER WITH KNEE BRACES AS SHOWN ON PAGE 58 OR WITH LCL BRACES AS SHOWN ON PAGE 62. IF PALLETS ARE LOADED TWO WIDE AND BRACED WITH CENTER GATES AND STRUTS, THE LOADS BEHIND THE BULKHEADS CAN BE GREATER THAN 50,000 POUNDS.
9. 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 PAGE 45 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 63 AND 66 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 65 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 4"	71	24
1" x 8"	17	12
2" x 2"	162	54
2" x 4"	140	94
2" x 6"	73	73
4" x 4"	21	28
NAILS	NO. REQD	POUNDS
6d (2")	338	2
10d (3")	314	5
12d (3-1/4")	46	1
16d (3-1/2")	40	1
STEEL STRAPPING, 1-1/4" -----72' REQD-----11 LBS		
SEAL FOR 1-1/4" STRAPPING-----4 REQD-----NIL		
STAPLE -----6 REQD-----NIL		
WIRE, NO. 14 GAGE -----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	152,592 LBS
DUNNAGE		392 LBS
TOTAL WEIGHT		153,184 LBS

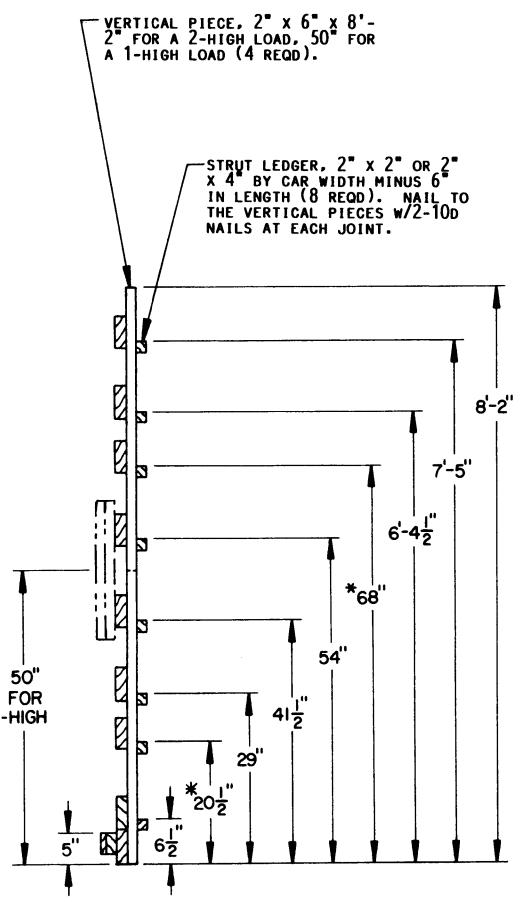
ALL UNITS

48-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS



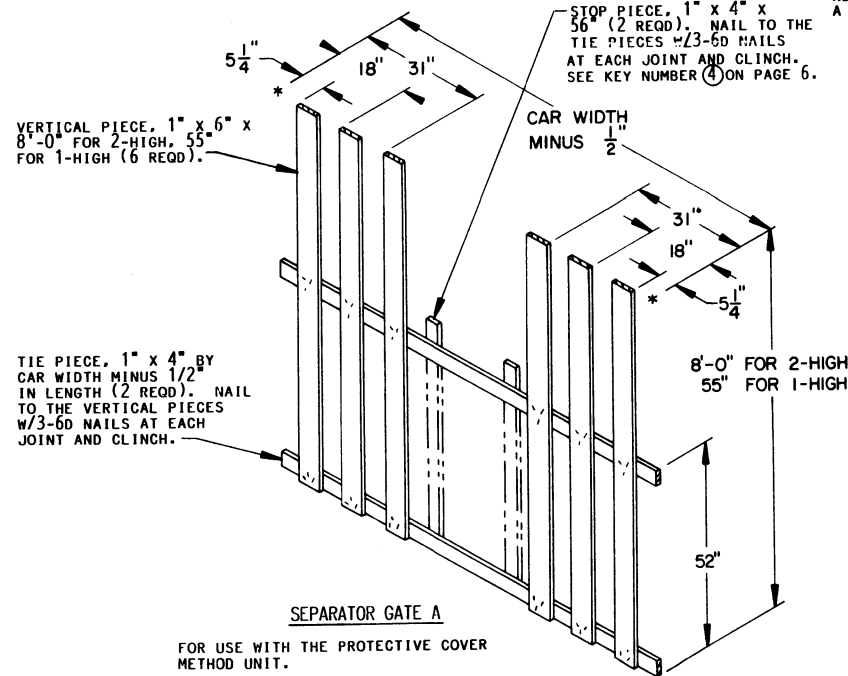
CENTER GATE A

FOR USE WITH THE PROTECTIVE COVER METHOD UNIT IN THE LOAD SHOWN ON PAGE 6.



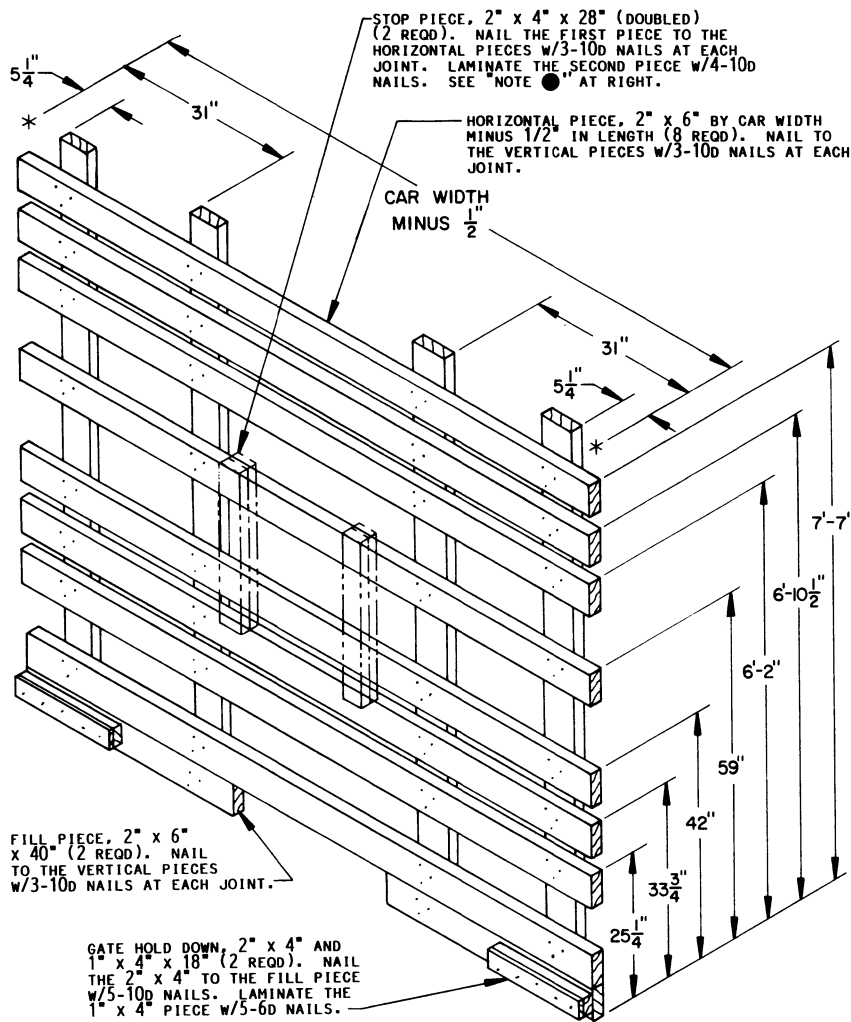
END VIEW

*STRUT LEDGERS AND STRUTS NOT REQUIRED AT THESE LEVELS IN A 40' CAR.

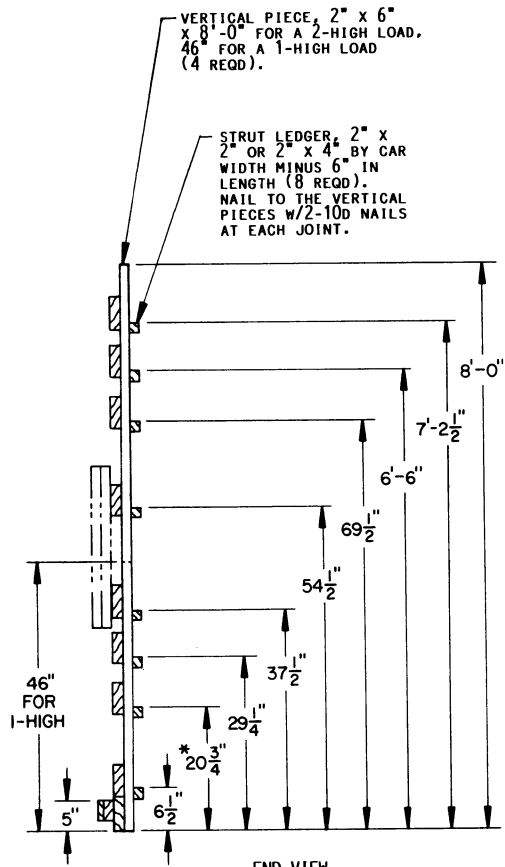


SEPARATOR GATE A

FOR USE WITH THE PROTECTIVE COVER METHOD UNIT.



NOTE ●: STOP PIECES ARE REQUIRED ON A GATE IN THE DOORWAY OR WITHIN 6" OF THE DOORWAY OF A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN NAILED FLOORLINE DOORWAY PROTECTION IS USED.

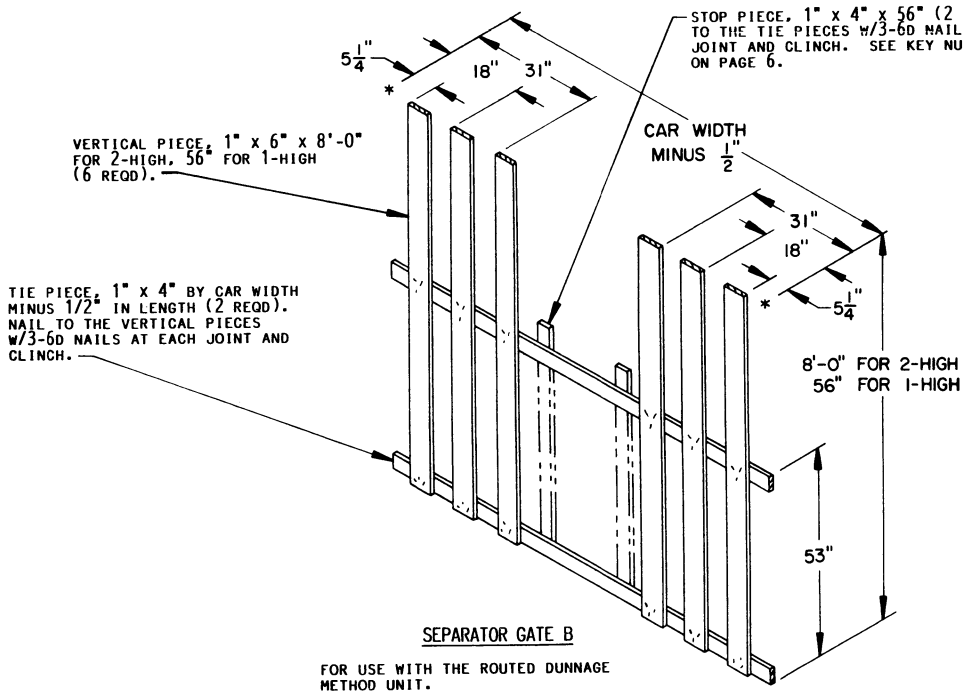


CENTER GATE B

FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT IF SHIPPED USING THE PROCEDURES SHOWN ON PAGE 6.

END VIEW

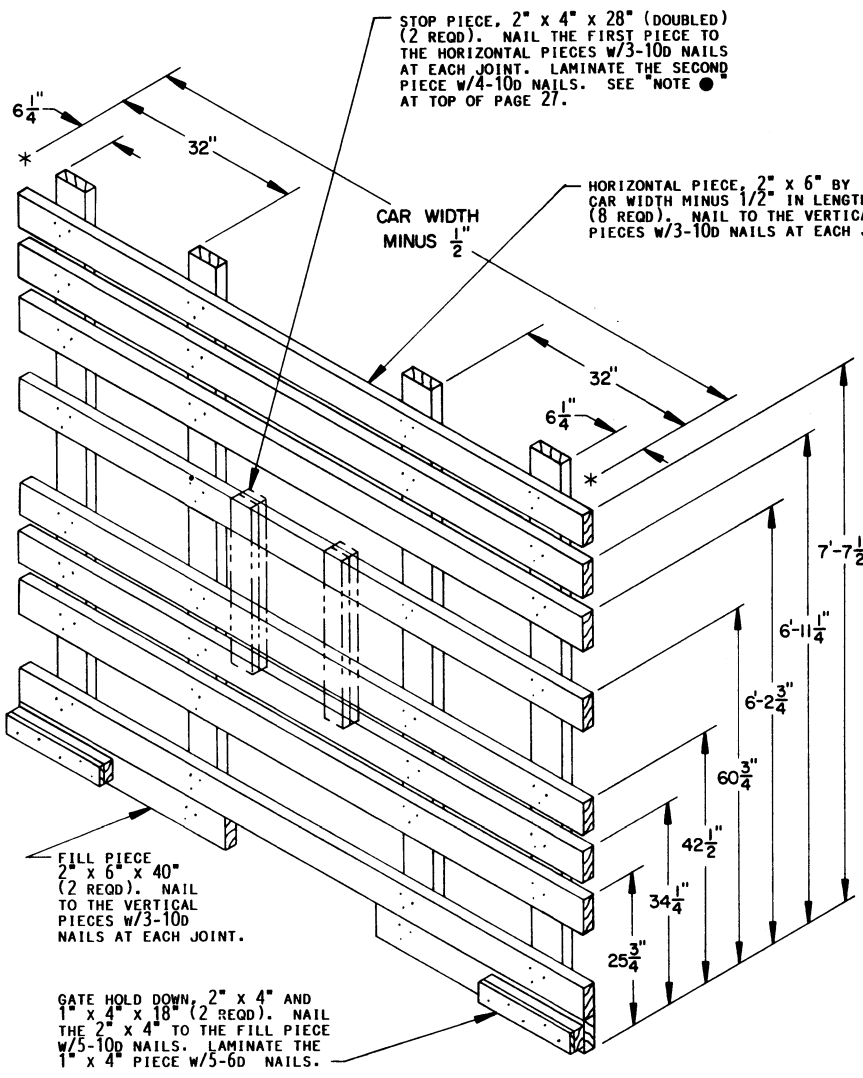
*STRUT LEDGERS AND STRUTS NOT REQUIRED AT THESE LEVELS IN A 40' LONG CAR.



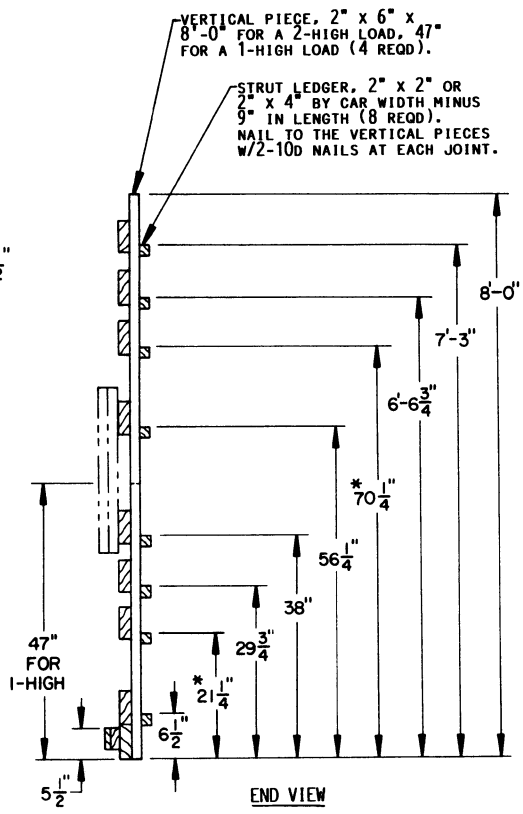
SEPARATOR GATE B

FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT.

DETAILS

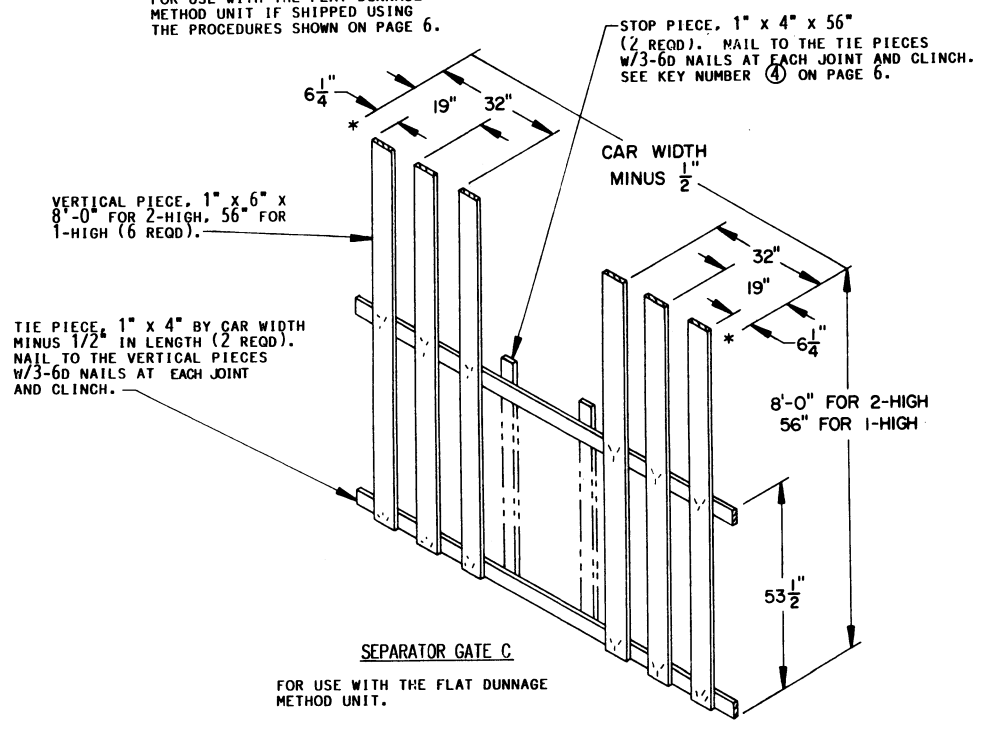


*STRUT LEDGERS AND STRUTS ARE NOT REQUIRED AT THESE LEVELS IN A 40'-6" LONG CAR.



CENTER GATE C

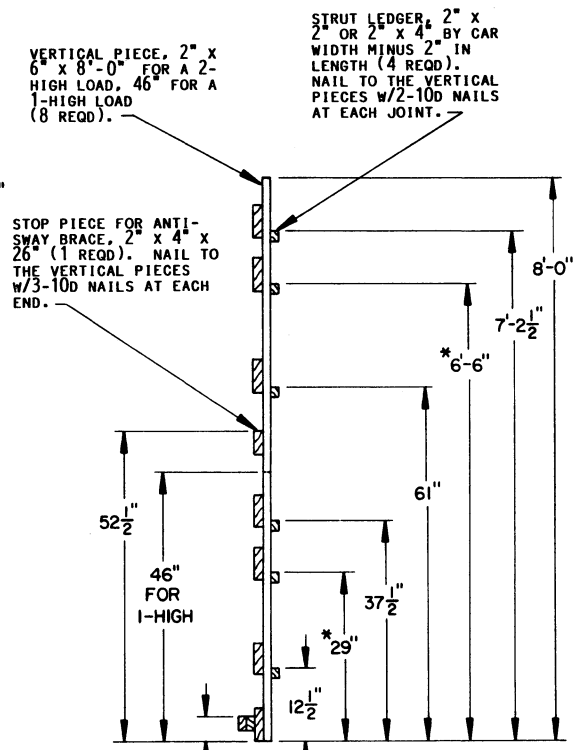
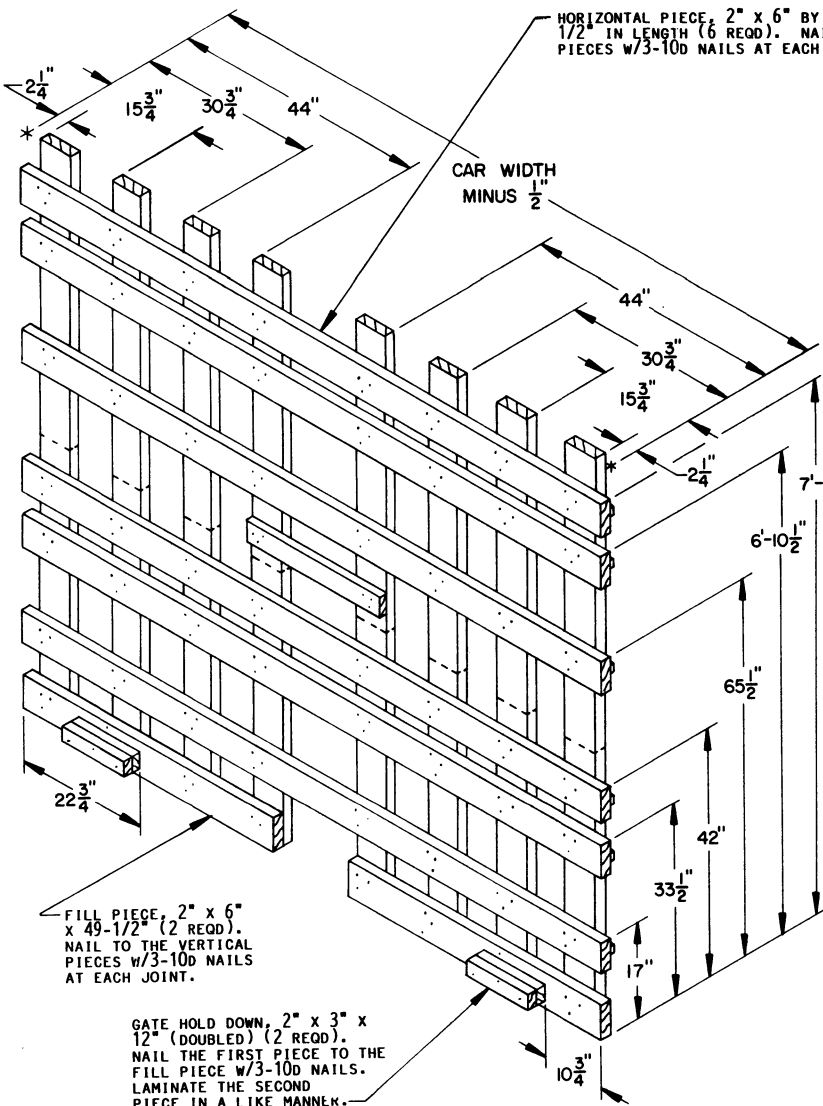
FOR USE WITH THE FLAT DUNNAGE METHOD UNIT IF SHIPPED USING THE PROCEDURES SHOWN ON PAGE 6.



SEPARATOR GATE C

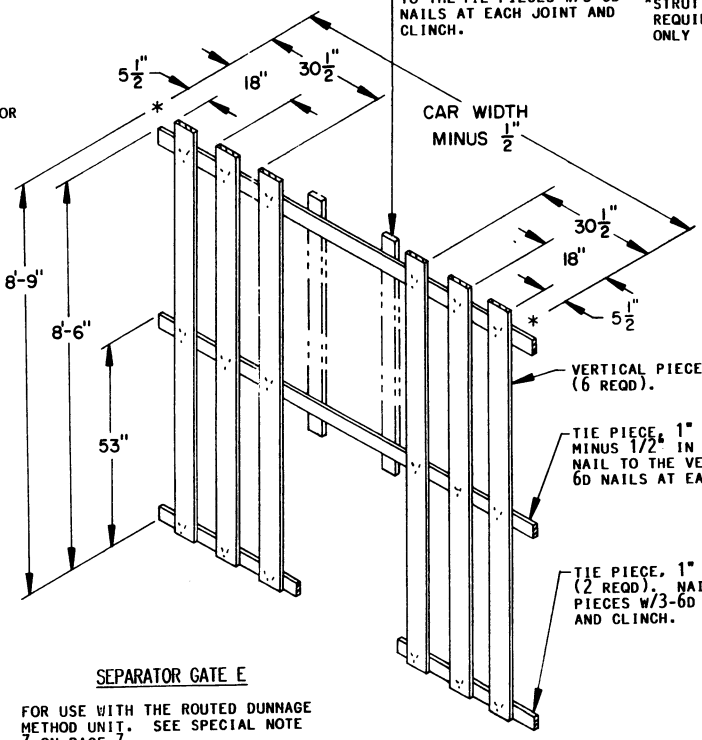
FOR USE WITH THE FLAT DUNNAGE METHOD UNIT.

DETAILS



CENTER GATE E

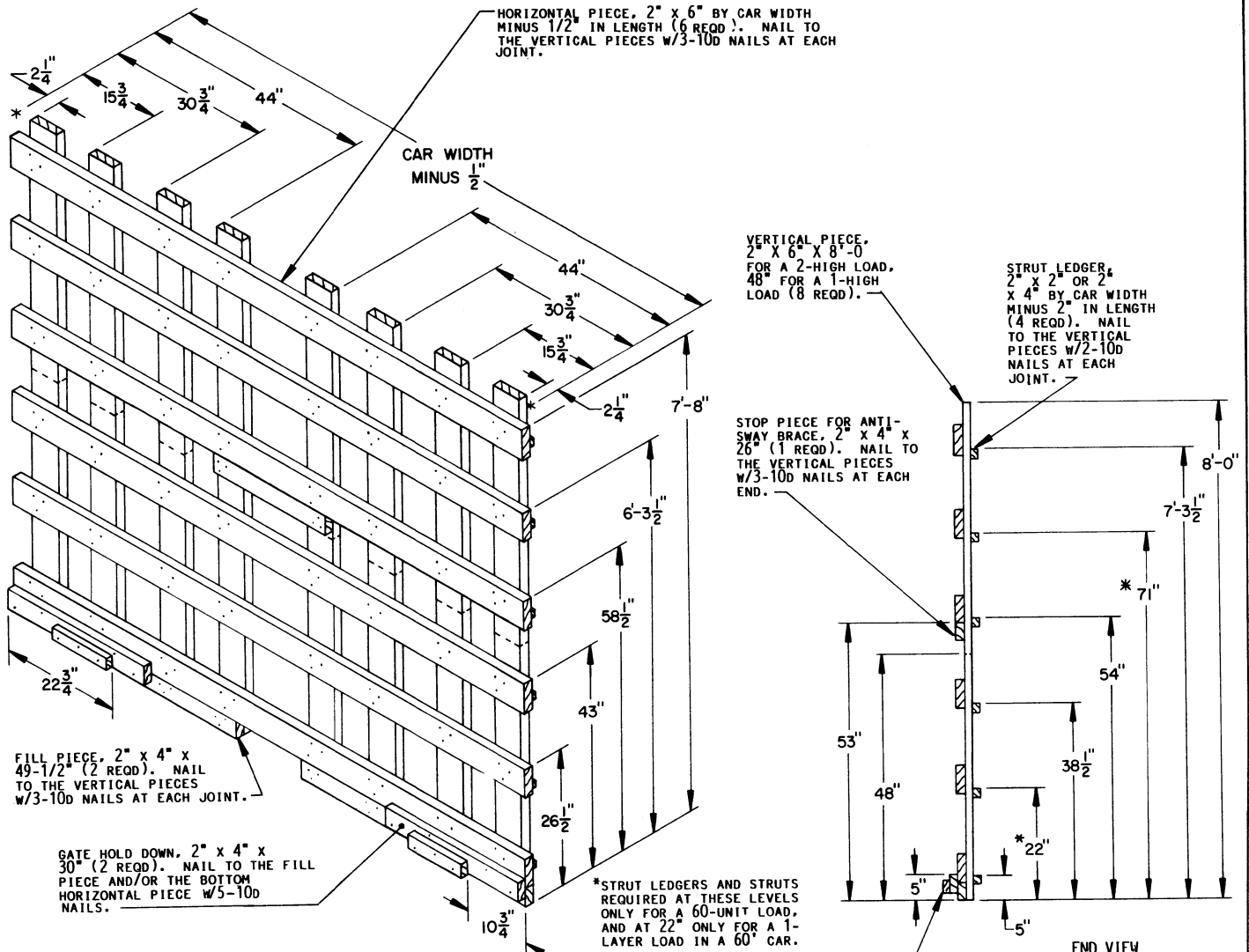
FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT IF SHIPPED USING THE PROCEDURES SHOWN ON PAGE 8, 12, OR 14.



SEPARATOR GATE E

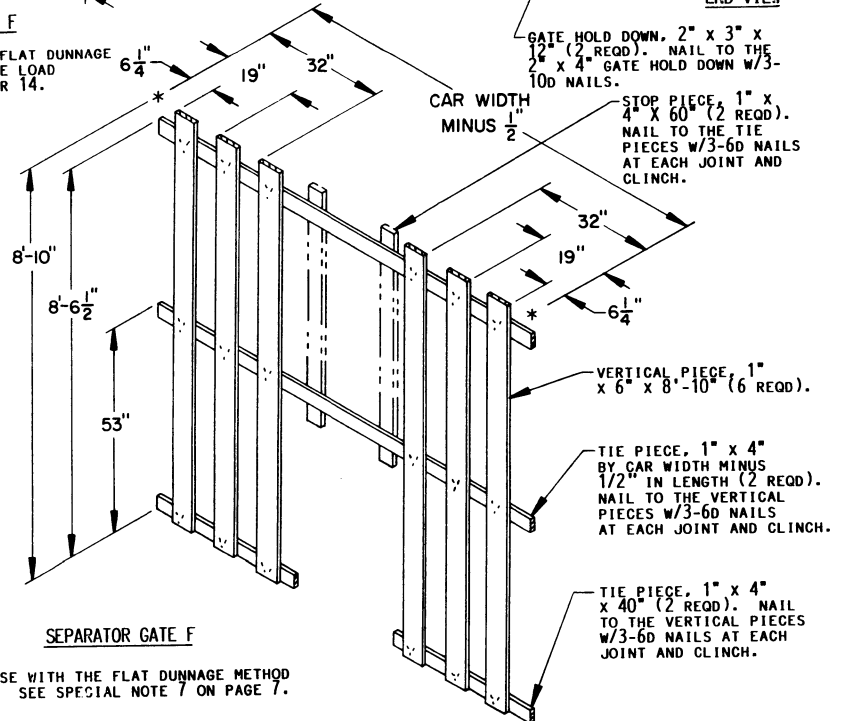
FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT. SEE SPECIAL NOTE 7 ON PAGE 7.

*STRUT LEDGERS AND STRUTS REQUIRED AT THESE LEVELS ONLY IN A 60' CAR.



CENTER GATE F

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT IN THE LOAD SHOWN ON PAGE 8 OR 14.



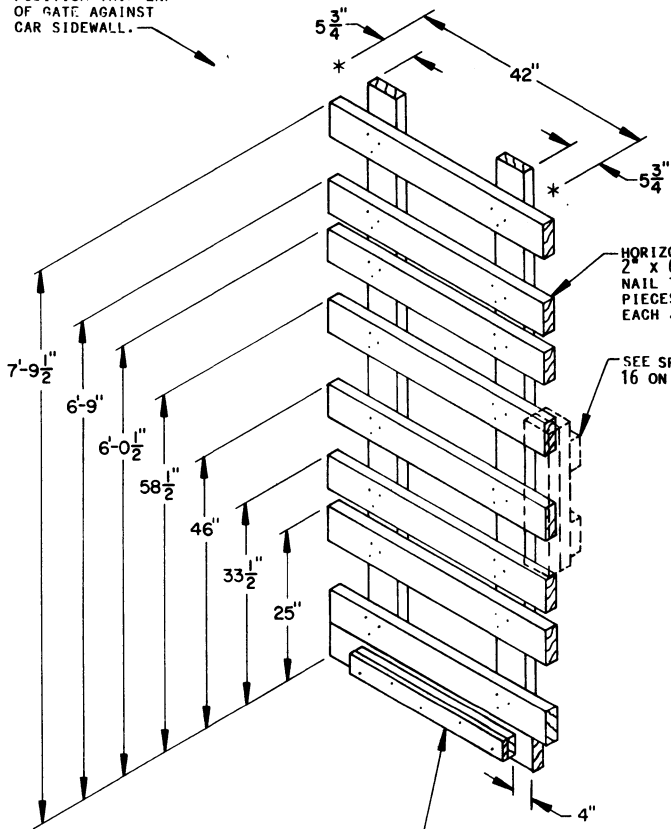
SEPARATOR GATE F

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT. SEE SPECIAL NOTE 7 ON PAGE 7.

DETAILS

*STRUT LEDGERS AND STRUTS NOT REQUIRED AT THESE LEVELS IN A 40" CAR.

POSITION THIS END OF GATE AGAINST CAR SIDEWALL.

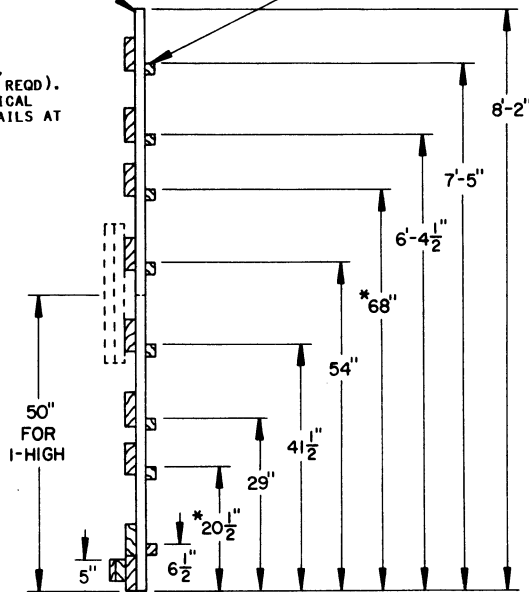


VERTICAL PIECE, 2" x 6" x 8'-2" FOR A 2-HIGH LOAD, 50" FOR A 1-HIGH LOAD (2 REQ.).

STRUT LEDGER, 2" x 2" OR 2" x 4" x 36" (8 REQ.). NAIL TO THE VERTICAL PIECES W/2-10D NAILS AT EACH JOINT.

HORIZONTAL PIECE, 2" x 6" x 42" (8 REQ.). NAIL TO THE VERTICAL PIECES W/3-10D NAILS AT EACH JOINT.

SEE SPECIAL NOTE 16 ON PAGE 7.



EN VIEW

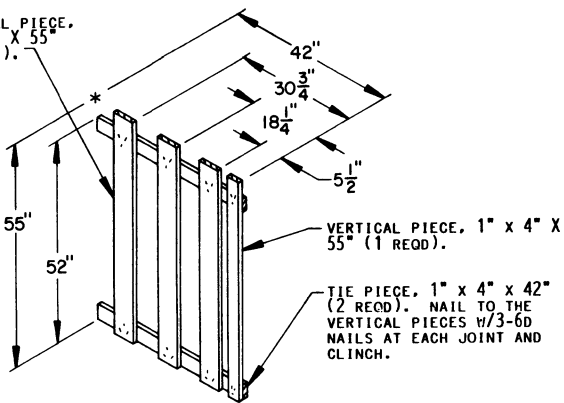
FILL PIECE, 2" x 6" x 40" (1 REQ.). NAIL TO THE VERTICAL PIECES W/3-10D NAILS AT EACH JOINT.

GATE HOLD DOWN, 2" x 4" AND 1" x 4" x 30" (1 REQ.). NAIL THE 2" x 4" TO THE FILL PIECE W/5-10D NAILS. LAMINATE THE 1" x 4" W/3-6D NAILS.

CENTER GATE G

FOR USE WITH THE PROTECTIVE COVER METHOD UNIT. SEE SPECIAL NOTE 10 ON PAGE 7.

VERTICAL PIECE, 1" x 6" x 55" (3 REQ.).



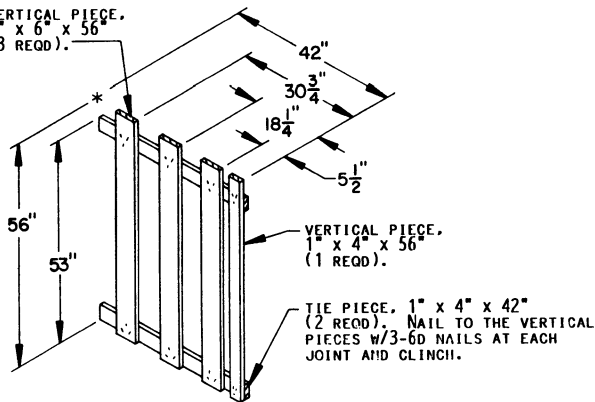
VERTICAL PIECE, 1" x 4" x 55" (1 REQ.).

TIE PIECE, 1" x 4" x 42" (2 REQ.). NAIL TO THE VERTICAL PIECES W/3-6D NAILS AT EACH JOINT AND CLINCH.

SEPARATOR GATE G

FOR USE WITH THE PROTECTIVE COVER METHOD UNIT IN THE LCL LOAD ON PAGE 18.

VERTICAL PIECE, 1" x 6" x 56" (3 REQ.).

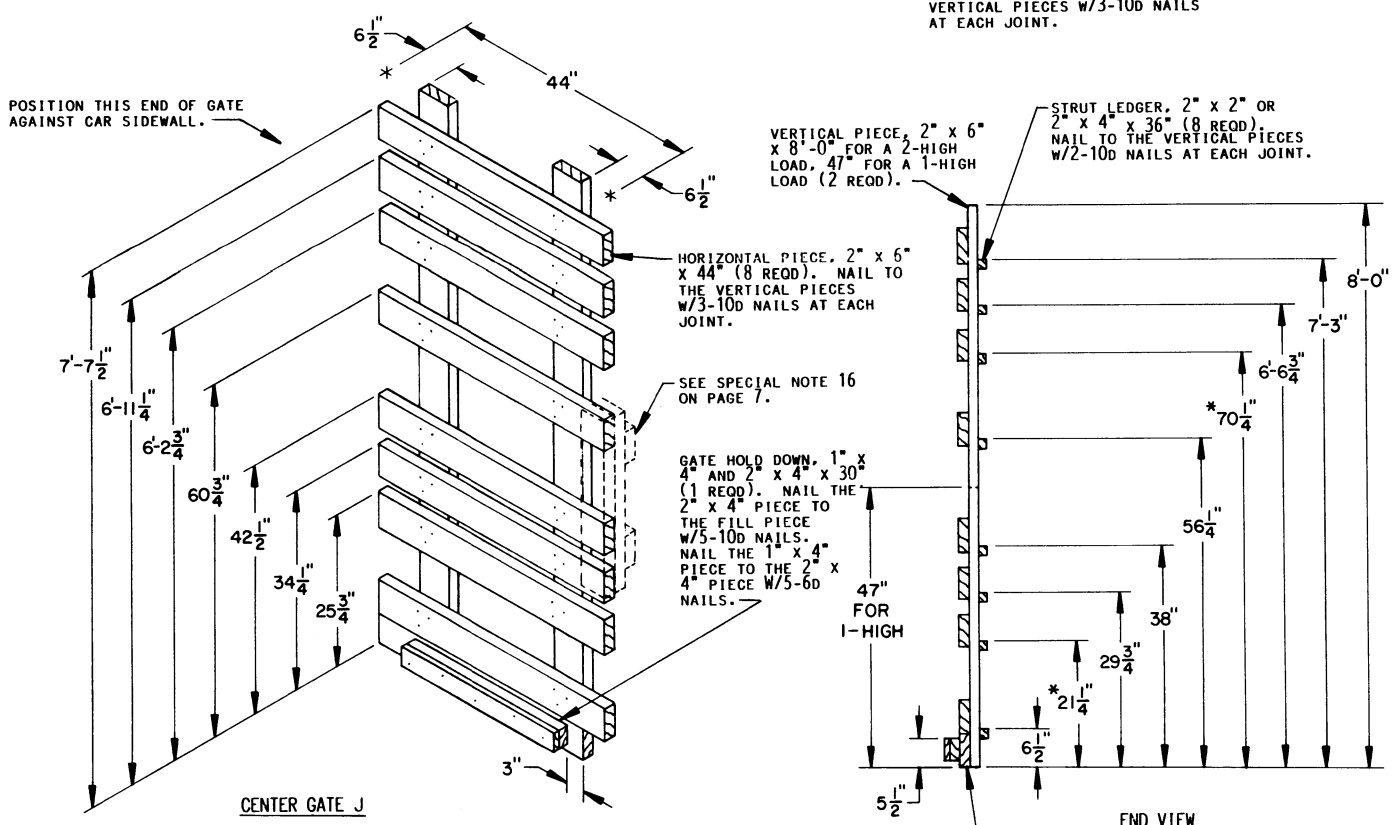
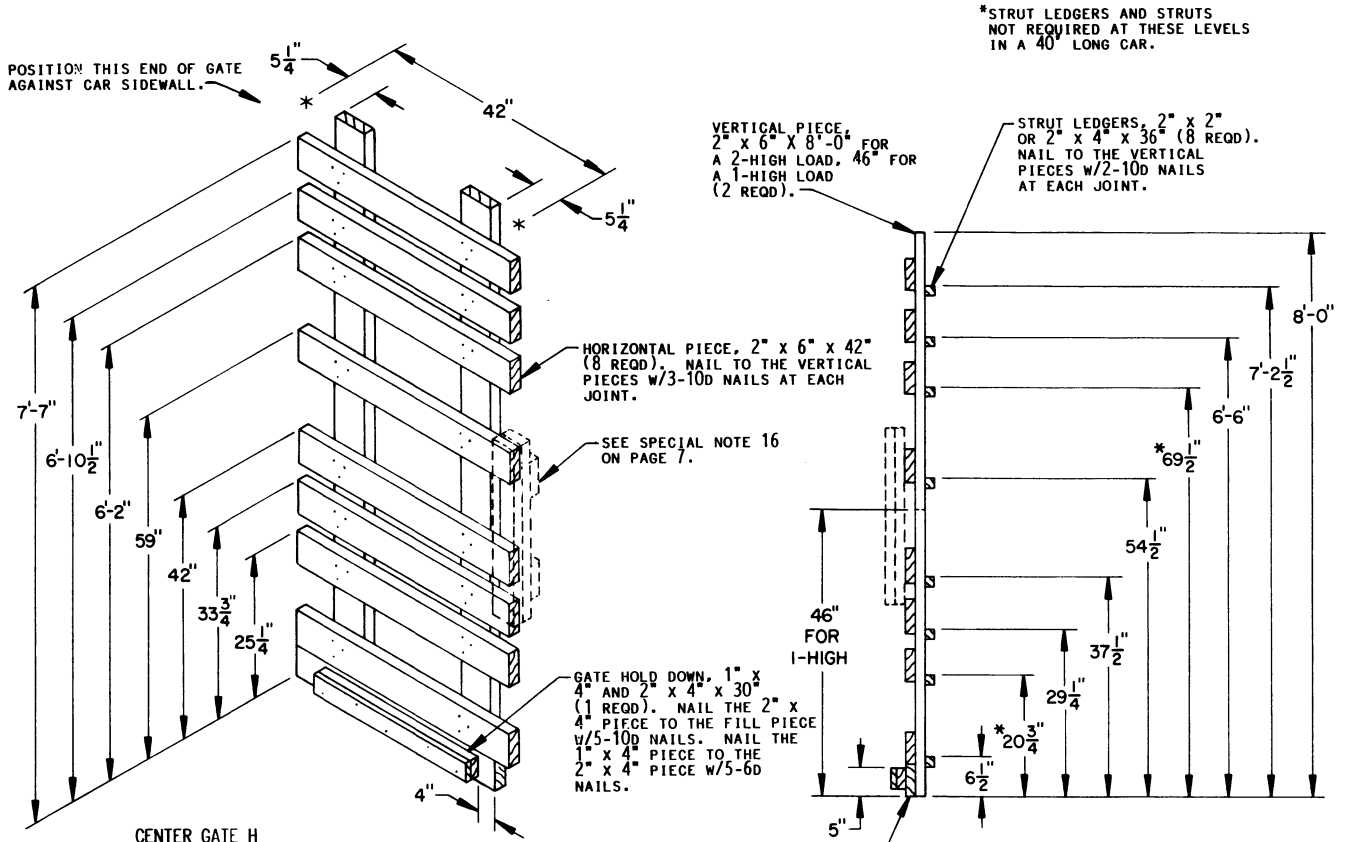


VERTICAL PIECE, 1" x 4" x 56" (1 REQ.).

TIE PIECE, 1" x 4" x 42" (2 REQ.). NAIL TO THE VERTICAL PIECES W/3-6D NAILS AT EACH JOINT AND CLINCH.

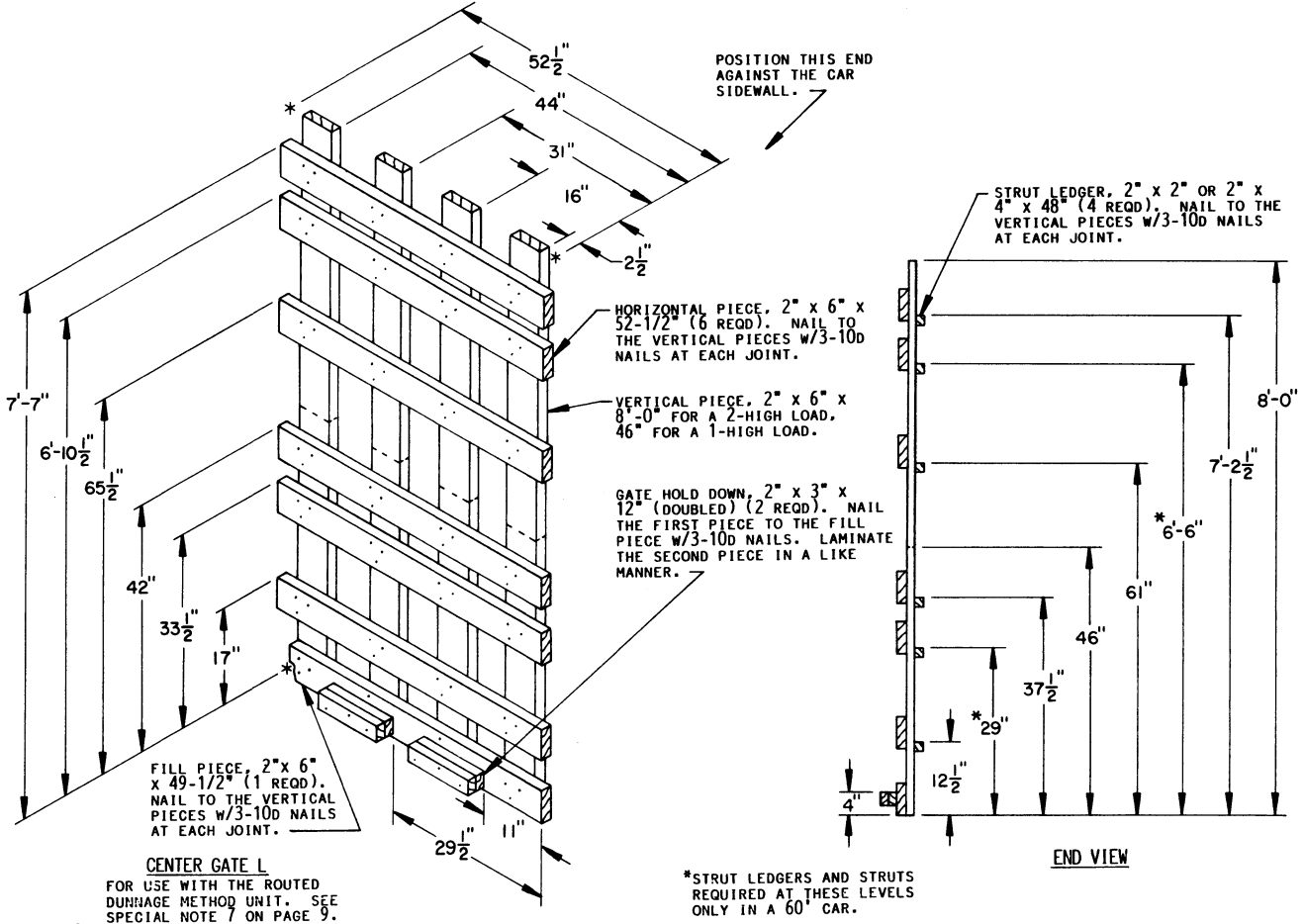
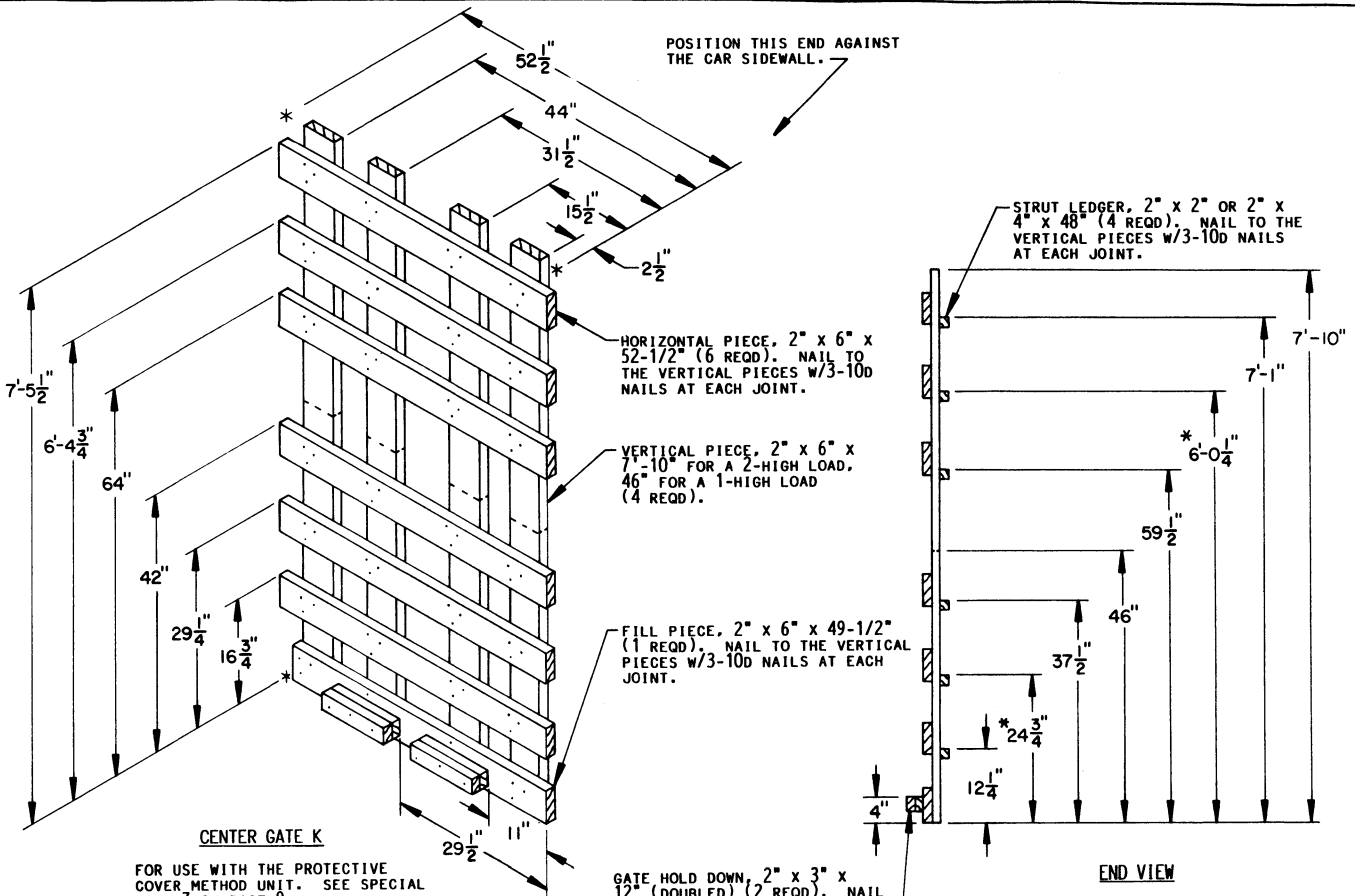
SEPARATOR GATE H

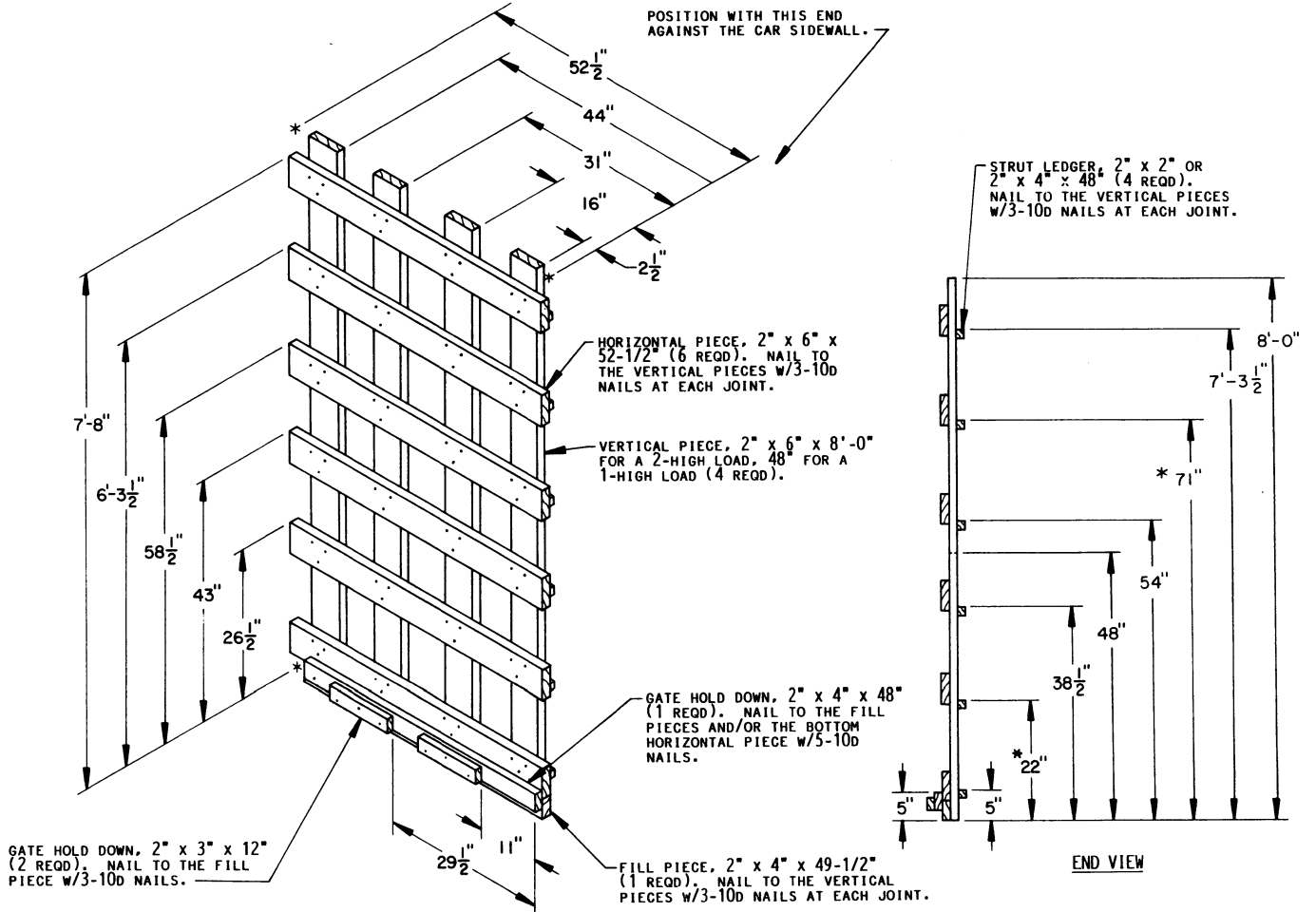
FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT IN THE LCL LOAD ON PAGE 18.



*STRUT LEDGERS AND STRUTS NOT REQUIRED AT THESE LEVELS IN A 40' LONG CAR.

DETAILS

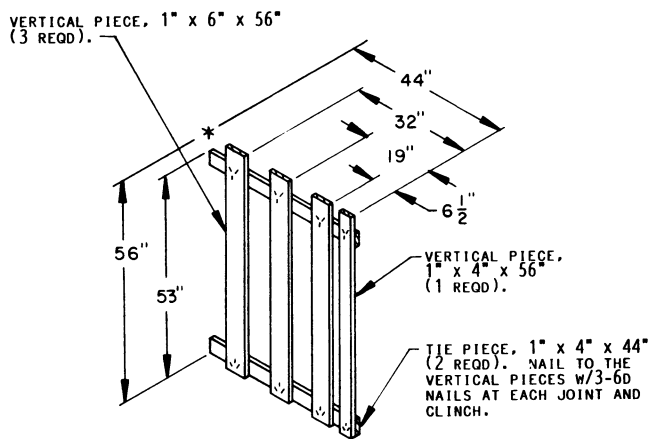




CENTER GATE M

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT. SEE SPECIAL NOTE 7 ON PAGE 9.

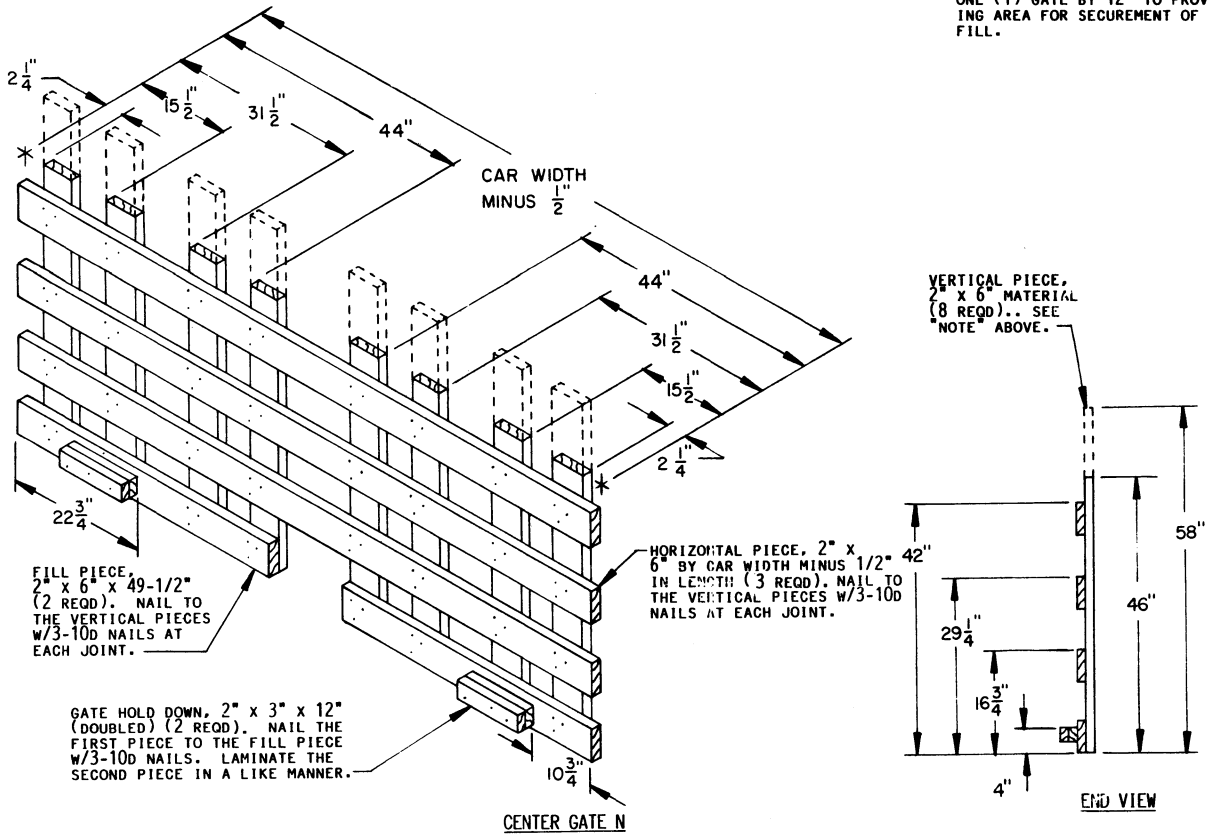
* STRUT LEDGERS AND STRUTS REQUIRED AT THESE LEVELS ONLY FOR A 60-UNIT LOAD, AND AT 22" ONLY FOR A 1-LAYER LOAD IN A 60' CAR.



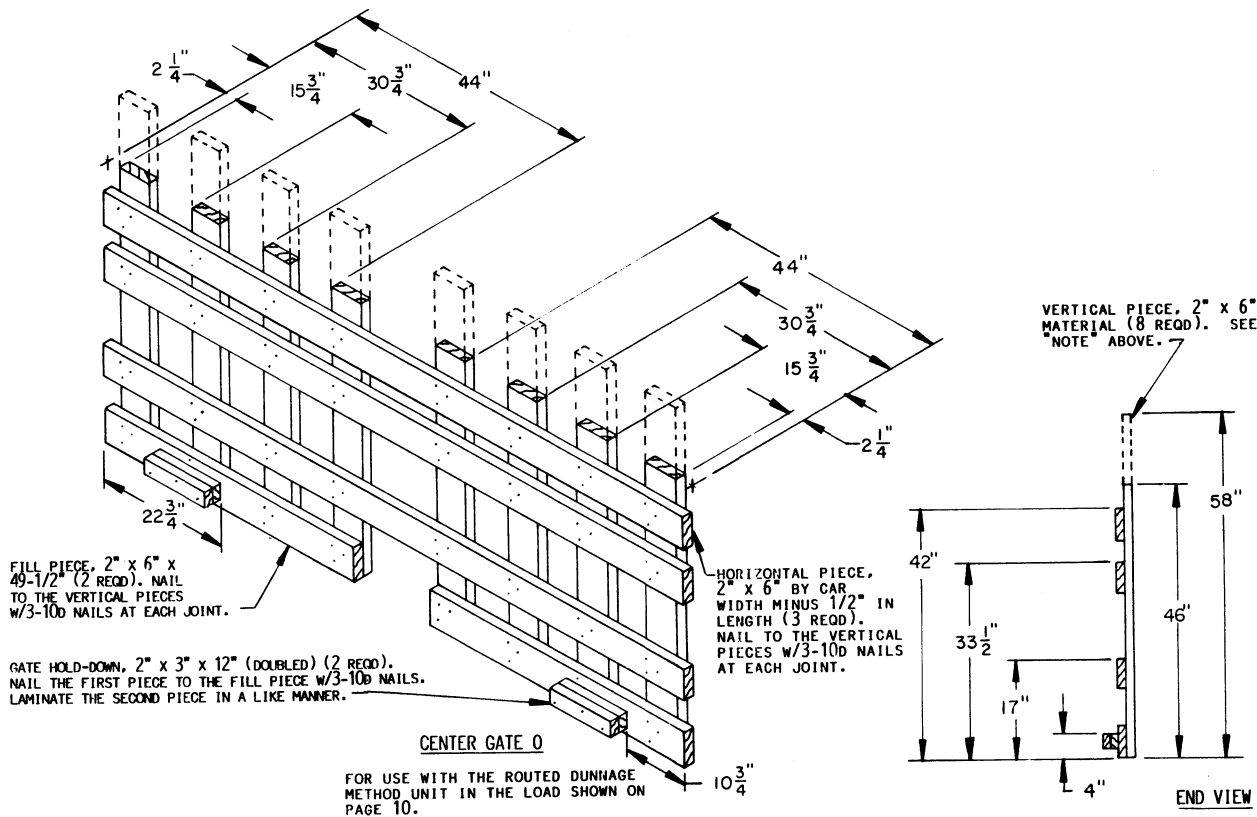
SEPARATOR GATE J

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT IN THE LCL LOAD ON PAGE 18.

NOTE: WHEN A LOAD IS TO BE BLOCKED AND BRACED WITH SOLID FILL IN LIEU OF STRUTS, THE STRUT LEDGERS WILL BE OMITTED FROM BOTH GATES. ALSO, EXTEND ALL THE VERTICAL PIECES OF ONE (1) GATE BY 12" TO PROVIDE A NAILING AREA FOR SECUREMENT OF THE SOLID FILL.

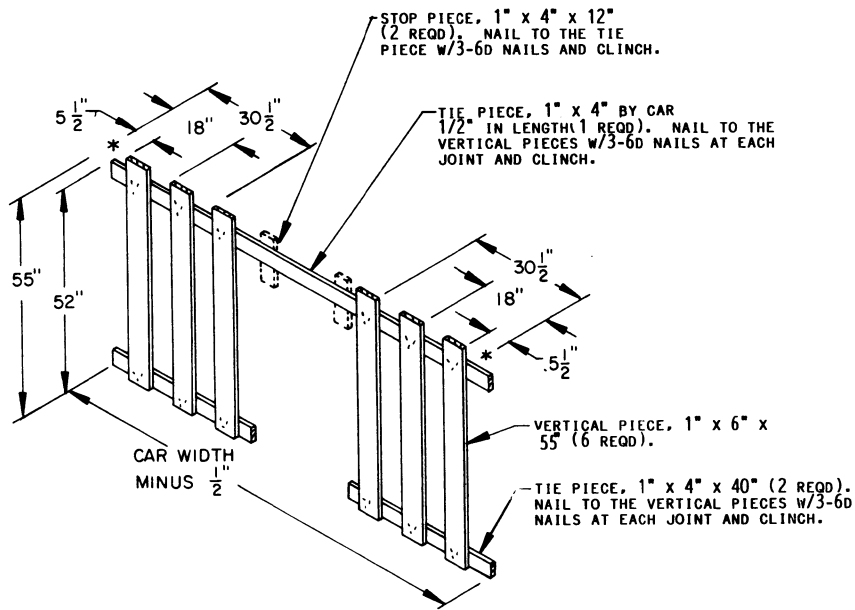


FOR USE WITH THE PROTECTIVE COVER METHOD UNIT IN THE LOAD SHOWN ON PAGE 10.



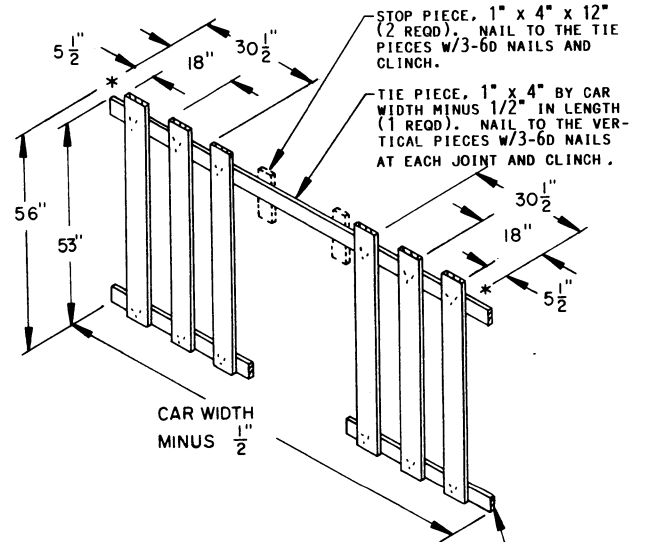
FOR USE WITH THE ROUTED DUNNAGE METHOD UNIT IN THE LOAD SHOWN ON PAGE 10.

DETAILS



SEPARATOR GATE K

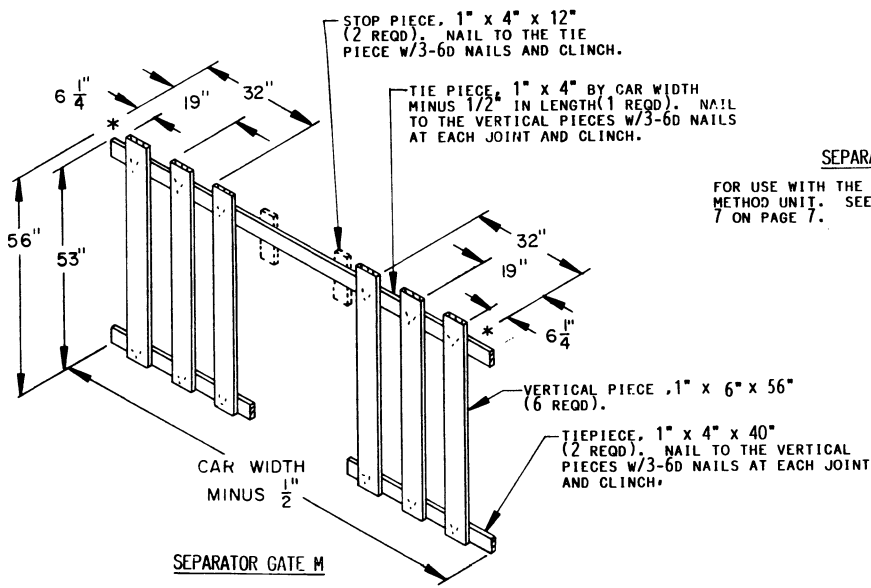
FOR USE WITH THE PROTECTIVE COVER
METHOD UNIT. SEE SPECIAL NOTE 7
ON PAGE 7.



SEPARATOR GATE L

FOR USE WITH THE ROUTED DUNNAGE
METHOD UNIT. SEE SPECIAL NOTE
7 ON PAGE 7.

TIE PIECE,
1" x 4"
x 40" (2
REQD).
NAIL TO THE
VERTICAL
PIECES
W/3-6D
NAILS AT
EACH JOINT
AND CLINCH.

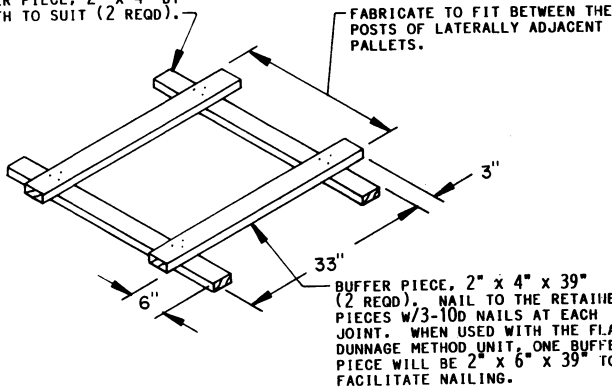


SEPARATOR GATE M

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT.
SEE SPECIAL NOTE 7 ON PAGE 7.

DETAILS

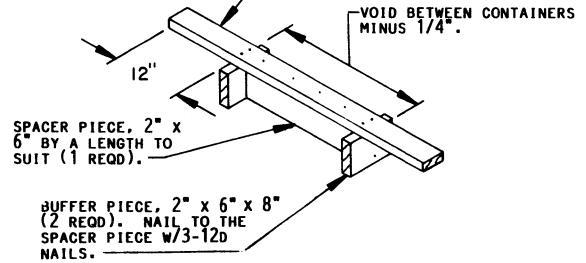
RETAINER PIECE, 2" x 4" BY A LENGTH TO SUIT (2 REQD).



ANTI-SWAY BRACE A

FOR USE WITH ALL PALLET UNITS WHEN THE CONTAINERS ARE LENGTHWISE IN THE CAR. 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 OPENINGS OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET UNIT. NOTE THAT WHEN THE ASSEMBLY IS USED WITH THE FLAT DUNNAGE METHOD UNITS, THE 2" x 6" BUFFER PIECE WILL BE APPLIED LAST.

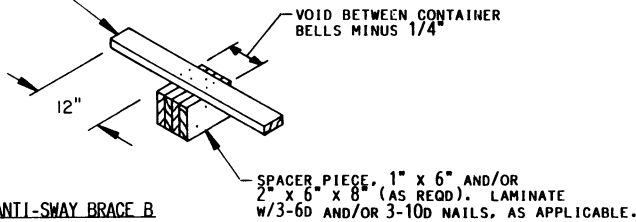
SUPPORT PIECE, 2" x 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO SPACER PIECE W/4-12D NAILS AND TO THE BUFFER PIECES W/2-12D NAILS AT EACH JOINT.



TOP-OF-LOAD ANTI-SWAY BRACE A

FOR USE WITH ALL CONTAINER-LENGTHWISE PALLET UNITS, AND FOR CROSSWISE PALLET UNITS IN CARS WIDER THAN 9'-4".

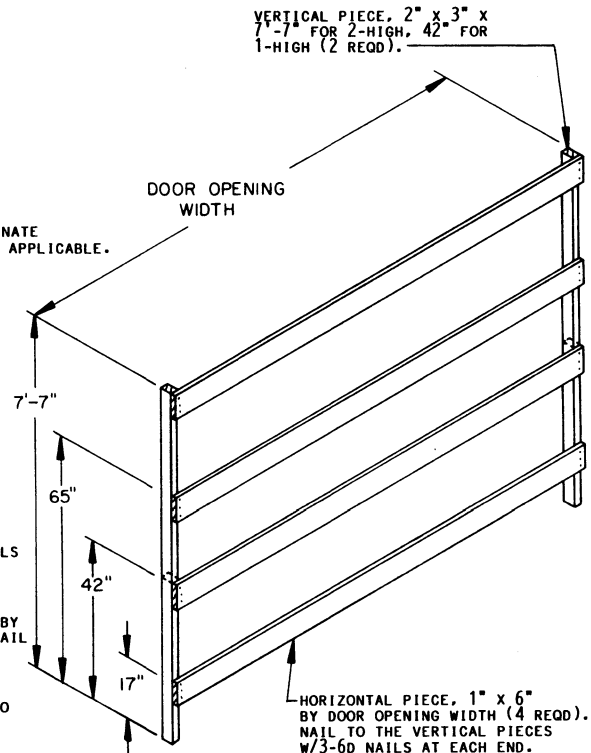
SUPPORT PIECE, 2" x 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECES W/6-10D NAILS.



TOP-OF-LOAD ANTI-SWAY BRACE B

FOR USE WITH ALL CONTAINERS-CROSSWISE PALLET UNITS IN CARS WIDER THAN 9'-2" BUT NOT MORE THAN 9'-4" WIDE.

VERTICAL PIECE, 2" x 3" x 7'-7" FOR 2-HIGH, 42" FOR 1-HIGH (2 REQD).



DOORWAY PROTECTION

FOR USE WITH ALL PALLET UNITS.

41-3/4" FOR PROTECTIVE COVER AND/OR ROUTED DUNNAGE METHOD UNITS; 43-3/4" FOR FLAT DUNNAGE METHOD UNITS.

CLEAT, 1" x 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE LONGITUDINAL PIECES W/2-6D NAILS AT EACH END AND TO A CROSS BRACE W/3-6D NAILS.

LONGITUDINAL PIECE, 2" x 2" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE CROSS BRACES W/2-10D NAILS AT EACH JOINT.

CROSS BRACE, 2" x 4" BY A LENGTH TO SUIT (2 REQD).

2" FOR PROTECTIVE COVER AND/OR ROUTED DUNNAGE METHOD UNITS.

3" FOR FLAT DUNNAGE METHOD UNITS.

VOID BETWEEN PALLET POSTS MINUS 1/2".

ANTI-SWAY BRACE B

FOR USE WITH ALL PALLET UNITS WHEN THE CONTAINERS ARE CROSSWISE IN THE CAR.

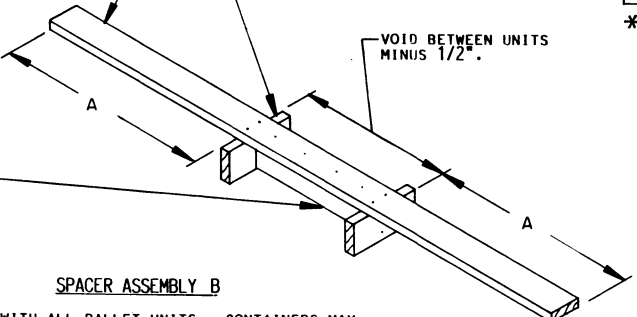
DIMENSION CHART			
CONTAINERS-LENGTHWISE			
DIM A	PROTECTIVE COVER UNIT	ROUTED DUNNAGE UNIT	FLAT DUNNAGE UNIT
	12"	38"	39"
CONTAINERS-CROSSWISE *			
DIM A	PROTECTIVE COVER UNIT	ROUTED DUNNAGE UNIT	FLAT DUNNAGE UNIT
	52-1/2"	52-1/2"	52-1/2"

STRAPPING BOARD, 2" x 6" BY A LENGTH TO SUIT (1 REQD.). NAIL TO THE SPACER PIECE W/4-12D NAILS AND TO THE BUFFER PIECES W/2-12D NAILS AT EACH JOINT.

BUFFER PIECE, 2" x 6" x 12" (2 REQD.). NAIL TO SPACER PIECE W/3-12D NAILS.

SPACER PIECE, 2" x 6" BY A LENGTH TO SUIT (1 REQD.).

VOID BETWEEN UNITS MINUS 1/2".



SPACER ASSEMBLY B

FOR USE WITH ALL PALLET UNITS. CONTAINERS MAY BE POSITIONED LENGTHWISE OR CROSSWISE IN SOME LOADS. SEE THE DIMENSION CHART ABOVE.

* THIS SPACER ASSEMBLY MAY BE USED IN CARS MORE THAN 9'-4" WIDE IN LIEU OF USING THE ASSEMBLIES SHOWN BELOW.

STRAPPING BOARD, 2" x 6" BY LOAD WIDTH (1 REQD.). NAIL TO THE SPACER PIECES W/6-12D NAILS.

VOID BETWEEN CONTAINER BELLS MINUS 1/4".

52 1/2"

52 1/2"

SPACER ASSEMBLY C

FOR USE WITH THE PROTECTIVE COVER AND/OR ROUTED DUNNAGE METHOD UNIT WHEN CONTAINERS ARE POSITIONED CROSSWISE IN CARS 9'-4" WIDE OR LESS.

SPACER PIECE, 1" x 6" AND/OR 2" x 6" x 12" (AS REQD.). LAMINATE W/3-6D AND/OR 3/10D NAILS, AS APPLICABLE.

FILLER CLEAT, 1" x 4" x 12" (2 REQD.). NAIL TO THE STRAPPING BOARD W/3-6D NAILS.

VOID BETWEEN CONTAINER BELLS MINUS 1/4".

52 1/2"

52 1/2"

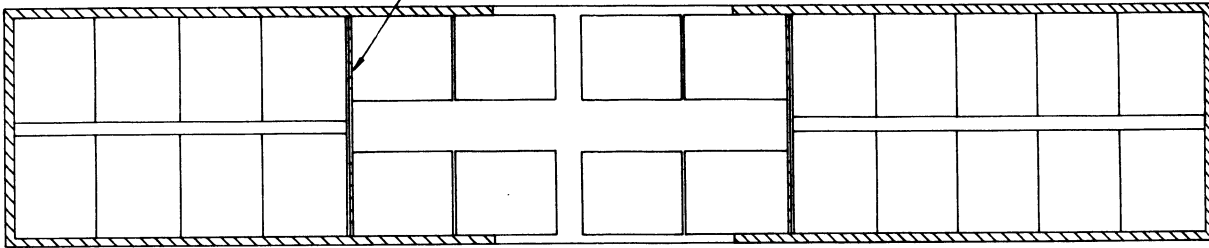
SPACER PIECE, 1" x 6" AND/OR 2" x 6" x 12" (AS REQD.). LAMINATE W/3-6D AND/OR 3-10D NAILS, AS APPLICABLE. FOR CARS WIDER THAN 9'-4", USE THE BUFFER PIECES AND SPACER PIECE SHOWN BY "SPACER ASSEMBLY A" ABOVE.

SPACER ASSEMBLY D

FOR USE WITH THE FLAT DUNNAGE METHOD UNIT WHEN CONTAINERS ARE POSITIONED CROSSWISE AS SHOWN IN THE LOAD ON PAGE 24.

STRAPPING BOARD, 2" x 6" BY LOAD WIDTH (1 REQD.). NAIL TO THE SPACER PIECES W/6-12D NAILS.

SEPARATOR GATE (1 OR 2 REQD. AS APPLICABLE);
SEE THE "SEPARATOR GATE 'N'" DETAIL ON PAGE 41.
POSITION AS SHOWN WITH THE VERTICAL PIECES
AGAINST THE LENGTHWISE POSITIONED PALLET UNITS.

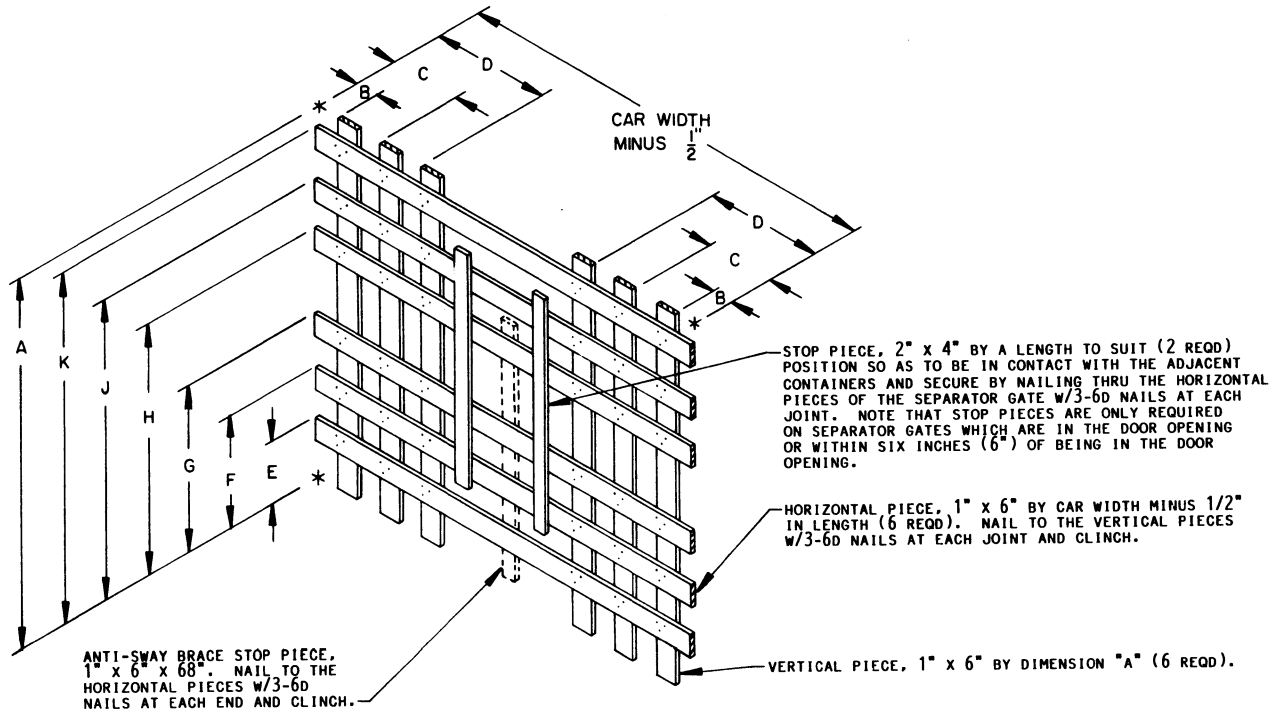


TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

SPECIAL NOTES:

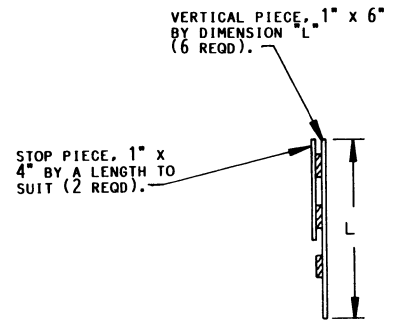
1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND CARS OF OTHER LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 41 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OF THE OTHER METHODS OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN, INCLUDING THE DEPICTED LCL PROCEDURES.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN SEPARATOR GATE "N", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "N" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE HORIZONTAL PIECES ARE AGAINST THE CROSSWISE UNITS OF THE LOAD.
4. THE CHART AT RIGHT SHOWS THE VARIOUS QUANTITIES (PER LAYER) WHICH CAN BE ATTAINED BY THE COMBINATION LOAD METHOD, AND THE PATTERNS REQUIRED TO PROVIDE THESE QUANTITIES. FOR COMPARISON PURPOSES, THE OTHER TYPE LOADS WHICH CAN BE USED TO ATTAIN A LIKE QUANTITY, OR A QUANTITY WITHIN THE RANGE OF THE COMBINATION LOAD METHOD, AS WELL AS THE APPROXIMATE LENGTH OF THE STRUTS ON THE AMOUNT OF SOLID FILL REQUIRED IS SHOWN.
5. STOP PIECES ARE ONLY REQUIRED ON SEPARATOR GATES WHICH ARE IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING. POSITION SO AS TO BE IN CONTACT WITH THE ADJACENT CONTAINERS AND SECURE BY NAILING THRU THE HORIZONTAL PIECES OF THE SEPARATOR GATE W/3-6D NAILS AT EACH JOINT.

LOAD PATTERN CHART			
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN FOR PROTECTIVE COVER METHOD UNIT, ROUTED DUNNAGE METHOD UNIT	STRUT LENGTH
60'-8"	32	CROSSWISE LOAD ON PAGE 12	50"
	30	6 WIDE AT 52-9/16" PLUS 9 LONG AT 42"	42-1/2"
	28	8 WIDE AT 52-9/16" PLUS 6 LONG AT 42"	42"
	26	LENGTHWISE LOAD ON PAGE 6	30-1/4"
50'-6"	28	CROSSWISE LOAD ON PAGE 10	SOLID FILL
	26	4 WIDE AT 52-9/16" PLUS 9 LONG AT 42"	SOLID FILL
	24	6 WIDE AT 52-9/16" PLUS 6 LONG AT 42"	26-1/2"
	22	8 WIDE AT 52-9/16" PLUS 3 LONG AT 42"	46"
40'-6"	20	LENGTHWISE LOAD ON PAGE 6	68-1/4"
	22	CROSSWISE LOAD ON PAGE 14	18"
	20	2 WIDE AT 52-9/16" PLUS 8 LONG AT 42"	35-3/4"
	18	4 WIDE AT 52-9/16" PLUS 6 LONG AT 42"	SOLID FILL
60'-8"	32	CROSSWISE LOAD ON PAGE 8	18"
	30	3 WIDE AT 52-9/16" PLUS 12 LONG AT 44"	32-1/2"
	28	8 WIDE AT 52-9/16" PLUS 6 LONG AT 44"	30"
	26	LENGTHWISE LOAD ON PAGE 4	30-1/4"
50'-6"	26	CROSSWISE LOAD ON PAGE 6	28"
	24	4 WIDE AT 52-9/16" PLUS 8 LONG AT 44"	33-1/4"
	22	8 WIDE AT 52-9/16" PLUS 3 LONG AT 44"	40"
	20	LENGTHWISE LOAD ON PAGE 4	68-1/4"
40'-6"	20	CROSSWISE LOAD ON PAGE 8	40"
	18	6 WIDE AT 52-9/16" PLUS 3 LONG AT 44"	26-1/2"
	16	LENGTHWISE LOAD ON PAGE 4	55"



SEPARATOR GATE N

THIS VIEW DEPICTS A SEPARATOR GATE FOR A 2-HIGH LOAD, APPLICABLE TO ANY OF THE UNITS COVERED BY THIS DOCUMENT. SEE THE DIMENSION CHART BELOW FOR GUIDANCE.

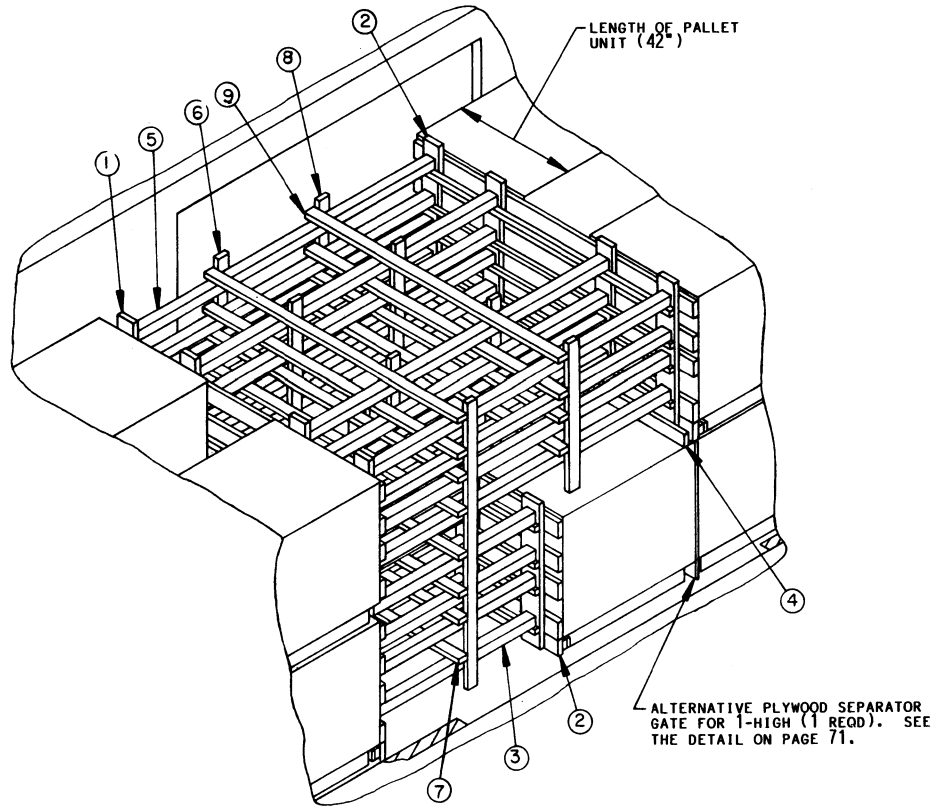


END VIEW

(FOR A 1-HIGH SEPARATOR GATE)

DIMENSION CHART											
PALLET UNIT	A	B	C	D	E	F	G	H	J	K	L
PROTECTIVE COVER UNIT	8'-0"	5-1/2"	18"	30-1/2"	16-3/4"	29-1/4"	42"	64"	6'-4-3/4"	7'-5-1/2"	46"
ROUTED DUNNAGE UNIT	8'-0"	5-1/2"	18"	30-1/2"	17"	33-1/2"	42"	65-1/2"	6'-10-1/2"	7'-7"	46"
FLAT DUNNAGE UNIT	8'-0"	6-1/4"	19"	32"	9-3/4"	26"	43"	58-3/4"	6'-1-1/2"	7'-6-1/2"	46"

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



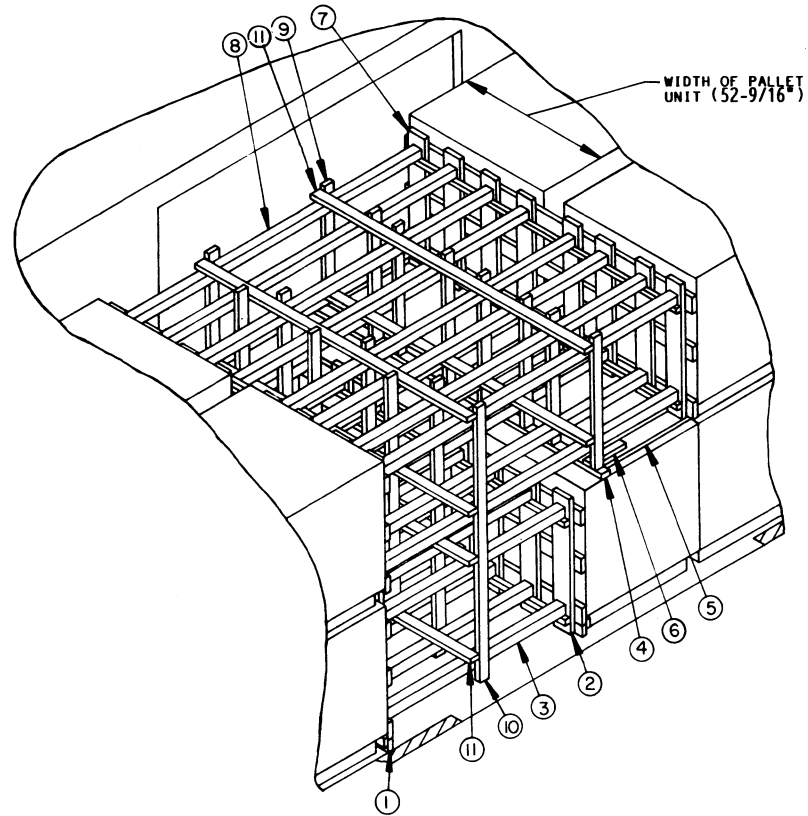
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. WIDER CARS AND CARS OF OTHER LENGTHS CAN ALSO BE USED.
2. THE PALLET UNIT SHOWN IS THE PROTECTIVE COVER METHOD UNIT. THE DEPICTED PROCEDURES ARE ADAPTABLE FOR ALL UNITS COVERED BY THIS DOCUMENT AND ARE APPLICABLE FOR THE OMISSION OF TWO PALLET UNITS FROM A FULL LOAD.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
4. CENTER GATE "A" IS ONLY APPLICABLE FOR THE PROTECTIVE COVER METHOD UNIT. WHEN SHIPPING THE ROUTED DUNNAGE METHOD UNIT, CENTER GATE "B" AS DETAILED ON PAGE 27, WILL BE USED; USE CENTER GATE "C" FOR THE FLAT DUNNAGE METHOD UNITS. ALSO, WHEN SHIPPING PALLET UNITS OTHER THAN THE PROTECTIVE COVER METHOD UNIT, A STRUT BRACING PAD, SIMILAR TO PIECE MARKED ④ ON PAGE 43, MUST BE POSITIONED UNDER PIECES MARKED ⑧ IN THIS LOAD.

- ① CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A", DETAIL ON PAGE 26. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 4 AT LEFT.
- ② CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 26.
- ③ STRUT, 4" x 4" BY CUT TO FIT (16 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL W/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ④ GATE SUPPORT PIECE, 2" x 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATE USED IN THE SECOND LAYER W/3-10D NAILS AT EACH JOINT.
- ⑤ STRUT, 4" x 4" BY CUT TO FIT (16 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ② IN THE SECOND LAYER AND TOENAIL W/2-16D NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" x 4" x 8'-0" (4 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" x 4" BY CAR WIDTH MINUS 2" IN LENGTH (8 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.
- ⑧ VERTICAL STRUT BRACING, 2" x 4" x 48" (4 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.
- ⑨ HORIZONTAL STRUT BRACING, 2" x 4" BY CAR WIDTH MINUS 2" IN LENGTH (4 REQD). NAIL TO THE STRUTS W/3-10D NAILS AT EACH JOINT.



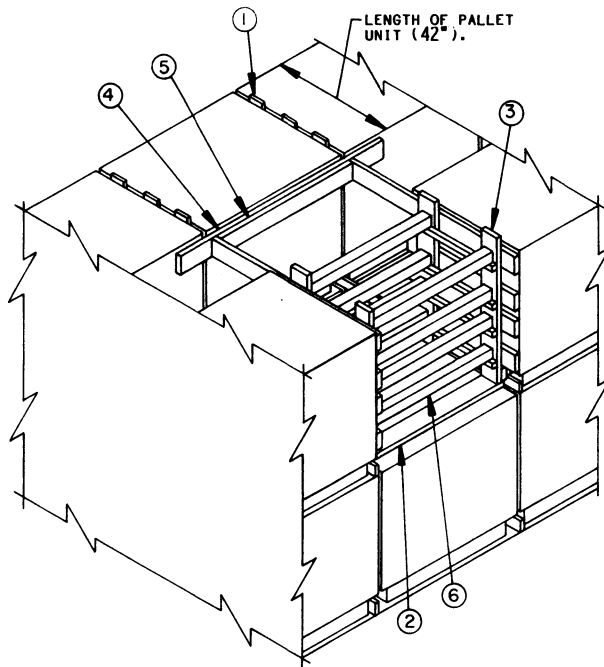
ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING. WIDER CARS AND CARS OF OTHER LENGTHS CAN ALSO BE USED. SEE SPECIAL NOTE 3.
2. THE PALLET UNIT SHOWN IS THE FLAT DUNNAGE METHOD UNIT. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR ALL UNITS COVERED BY THIS DOCUMENT AND ARE APPLICABLE FOR THE OMISSION OF TWO PALLET UNITS FROM A FULL LOAD.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
4. THE HEIGHT LOCATION OF THE HORIZONTAL, FILL AND HOLD DOWN PIECES MUST BE MODIFIED TO ALLOW FOR THE PLACEMENT OF PIECE MARKED ①. TO FABRICATE PIECE MARKED ① FOR THE FLAT DUNNAGE METHOD UNIT, REFER TO THE "CENTER GATE F" DETAIL ON PAGE 31 FOR LOCATION OF THE VERTICAL PIECES, AND THE END VIEW (FOR THE TOP LAYER) OF THE "LOAD BEARING GATE F" ON PAGE 47 FOR THE HEIGHT LOCATION FOR THE HORIZONTAL, FILL, AND HOLD DOWN PIECES. FOR THE PROTECTIVE COVER METHOD UNIT, REFER TO THE "CENTER GATE D" DETAIL ON PAGE 29 AND THE END VIEW (FOR THE TOP LAYER) OF "LOAD BEARING GATE D" DETAIL ON PAGE 45. FOR THE ROUTED DUNNAGE METHOD, SEE THE "CENTER GATE E" DETAIL ON PAGE 30 AND THE END VIEW (FOR THE TOP LAYER) OF THE "LOAD BEARING GATE E" DETAIL ON PAGE 47.
5. VERTICAL STRUT BRACING, PIECE MARKED ⑨, MAY BE ALTERNATED THE SAME AS PIECE MARKED ⑩. IF ALTERNATED, AN ADDITIONAL STRUT BRACING PAD WILL BE REQUIRED.

KEY NUMBERS

- ① CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 31.
- ② CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 31.
- ③ STRUT, 4" x 4" BY CUT TO FIT (REF: 72") (16 REQD). TOENAIL TO PIECES MARKED ① AND ② w/2-16D NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGES 2 AND 3.
- ④ STRUT BRACING PAD, 2" x 4" BY LENGTH TO SUIT (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN. SEE SPECIAL NOTE 5 AT LEFT.
- ⑤ GATE SUPPORT, 2" x 6" BY LENGTH TO SUIT (4 REQD). POSITION AGAINST STRUT BRACING PAD MARKED ④ AND EXTEND UNDER VERTICAL OF CENTER GATE MARKED ①. WIRE TIE TO PALLET STRAPPING BOARD ON THE END NEAREST THE TOP LAYER CENTER GATE.
- ⑥ HOLD DOWN PIECE, 2" x 4" x 15" (4 REQD). NAIL TO PIECES MARKED ④ AND ⑤ w/2-10D NAILS AT EACH JOINT.
- ⑦ CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 31. SEE SPECIAL NOTE 4 AT LEFT.
- ⑧ STRUT, 4" x 4" BY CUT TO FIT (REF: 9'-8") (16 REQD). TOENAIL TO PIECES MARKED ① AND ② w/2-16D NAILS AT EACH END.
- ⑨ VERTICAL STRUT BRACING, 2" x 4" x 45" (8 REQD). NAIL TO THE STRUTS w/3-10D NAILS AT EACH JOINT. TOENAIL TO PIECE MARKED ④ w/1-10D NAIL.
- ⑩ VERTICAL STRUT BRACING, 2" x 4" x 7'-10" (8 REQD). NAIL TO THE STRUTS w/3-10D NAILS AT EACH JOINT. ALTERNATE POSITION AS SHOWN.
- ⑪ HORIZONTAL STRUT BRACING, 2" x 4" BY CAR WIDTH MINUS 4" (6 REQD). NAIL TO THE STRUTS w/3-10D NAILS AT EACH JOINT.



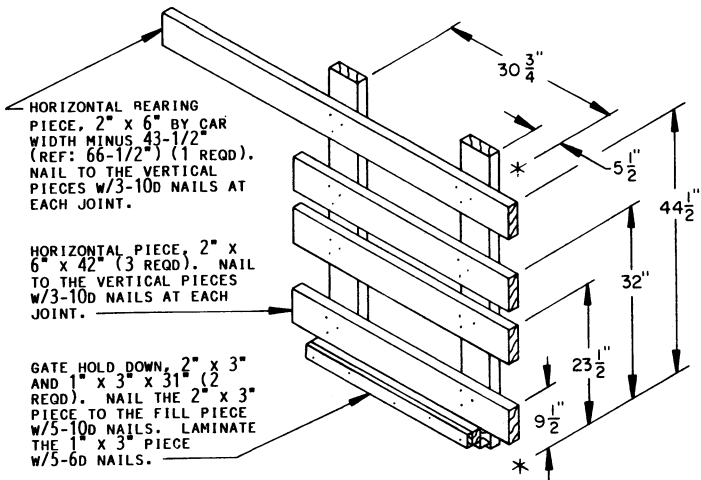
ISOMETRIC VIEW

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. THE PALLET UNIT SHOWN IS THE PROTECTIVE COVER METHOD UNIT. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. 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.
4. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
5. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
6. NOTE THAT THE TOP HORIZONTAL PIECE OF EACH SEPARATOR GATE, WHICH IS ADJACENT TO THE OMITTED UNIT AREA MUST BE 1" x 3" MATERIAL IN LIEU OF 1" x 4" AND MAY NEED TO BE ADJUSTED IN HEIGHT SO AS TO PROVIDE CLEARANCE BETWEEN IT AND THE CONTAINERS ON THE UNIT BELOW AS WELL AS CLEARANCE BETWEEN IT AND THE LOAD BEARING GATE, PIECE MARKED (3). ALSO, THE VERTICAL PIECES MUST BE OF A LENGTH SO AS TO BE FLUSH WITH THE TOP OF THE 1" x 3" HORIZONTAL PIECE.

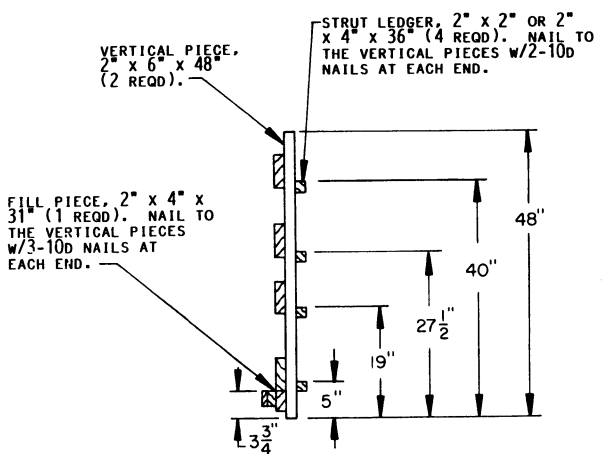
KEY NUMBERS

- (1) MODIFIED SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE A", "B", OR "C" DETAIL ON PAGE 26, 27, OR 28 FOR POSITIONING OF THE VERTICAL PIECES. SEE SPECIAL NOTE 6 AT LEFT FOR GATE MODIFICATIONS. POSITION GATE SO THE HORIZONTAL PIECES ARE AWAY FROM THE OMITTED UNIT AREA.
- (2) SUPPORT PIECE, 2" x 6" x 52-9/16" (2 REQD). POSITION SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED (3).
- (3) LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE LOAD BEARING GATE DETAIL BELOW OR ON PAGE 46. NAIL TO THE FILLER PIECE, PIECE MARKED (5) w/3-10D NAILS AT EACH JOINT. **CAUTION:** USE CARE NOT TO TOENAIL INTO CONTAINERS.
- (4) ANTI-SWAY BEARING PIECE, 2" x 6" x 6'-9" (1 REQD).
- (5) FILLER PIECE, 2" x 6" x 51" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED (4), w/5-10D NAILS.
- (6) STRUT, 4" x 4" x 48" (8 REQD). TOENAIL TO PIECE MARKED (3) w/2-16D NAILS AT EACH END.



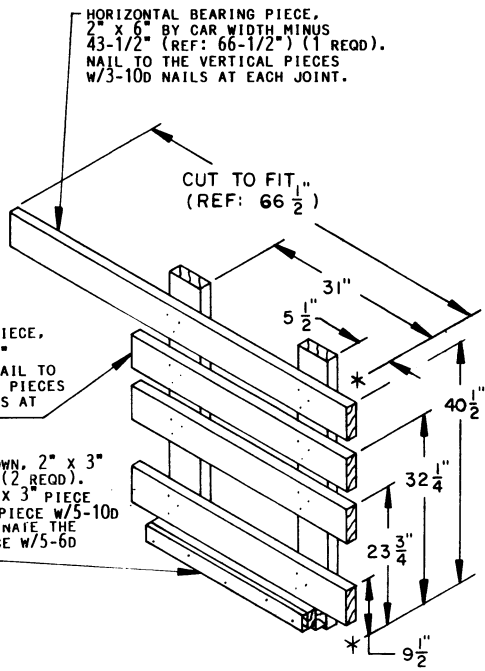
LOAD BEARING GATE A

(FOR USE WITH PROTECTIVE COVER METHOD UNITS)



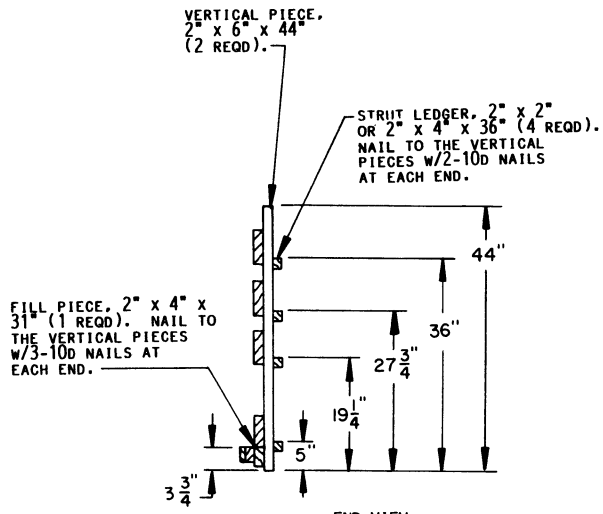
END VIEW

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

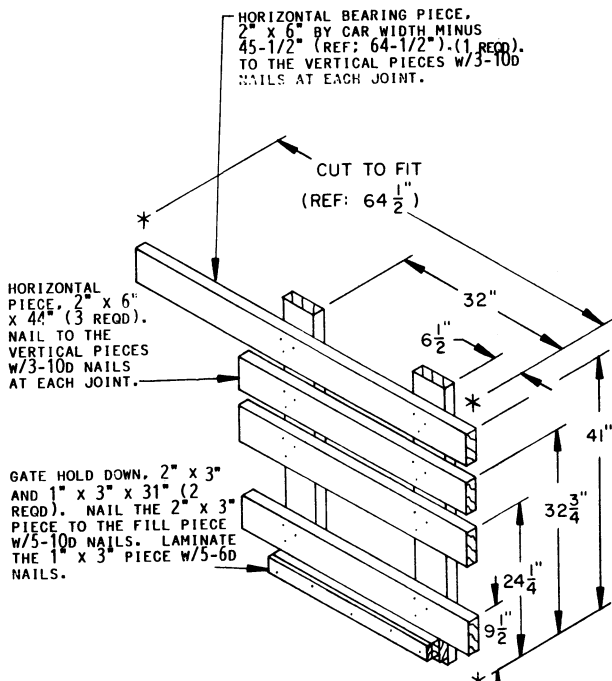


LOAD BEARING GATE B

(FOR USE WITH ROUTED DUNNAGE METHOD UNITS).

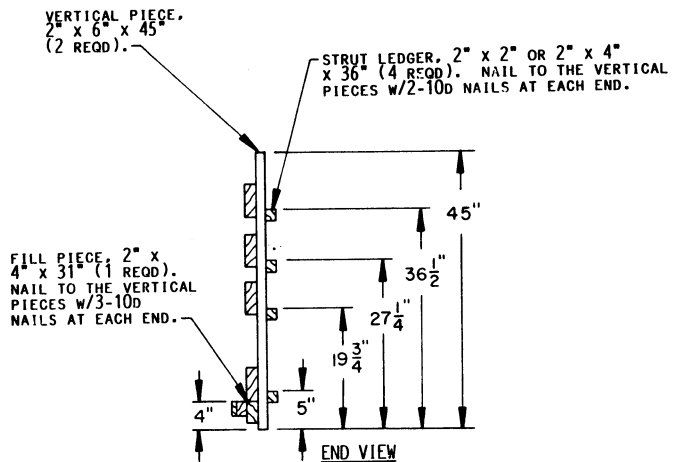


END VIEW



LOAD BEARING GATE C

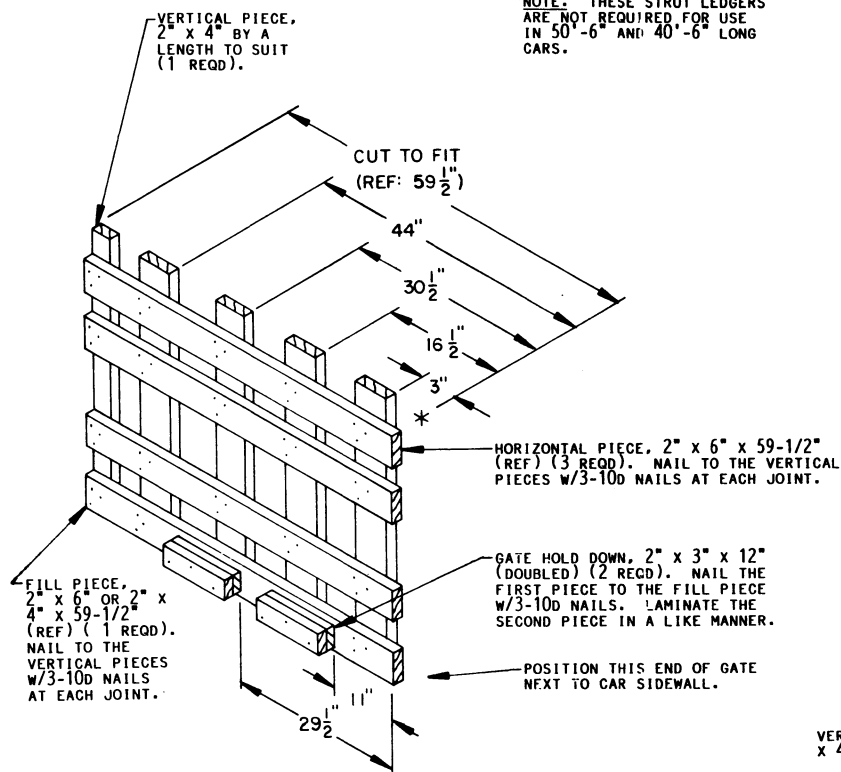
(FOR USE WITH FLAT DUNNAGE METHOD UNITS)



END VIEW

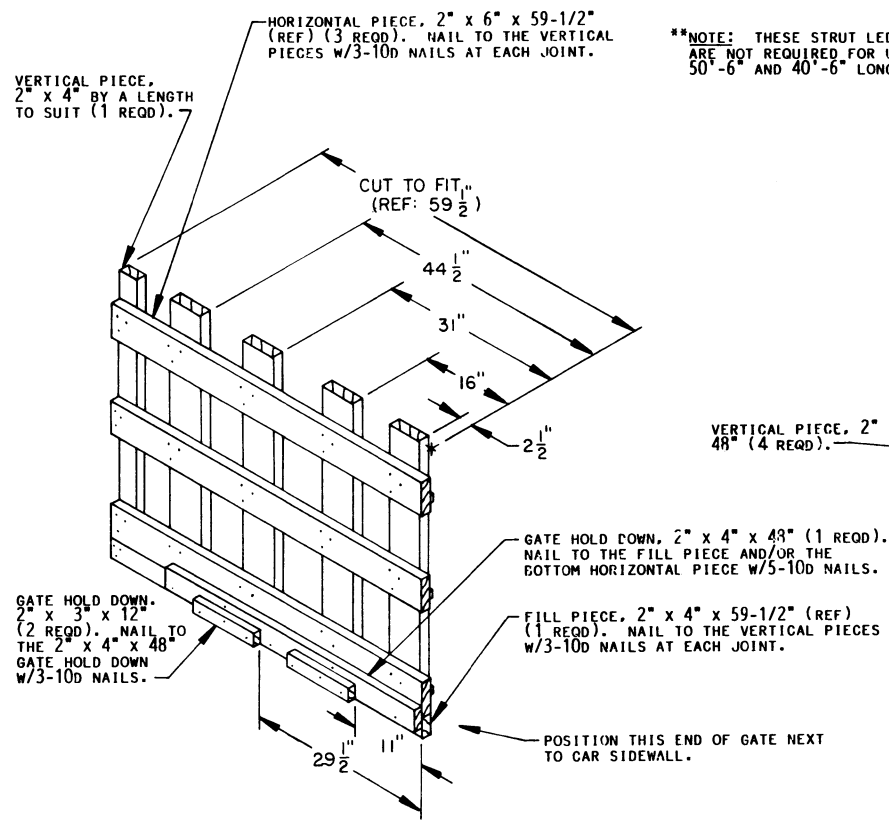
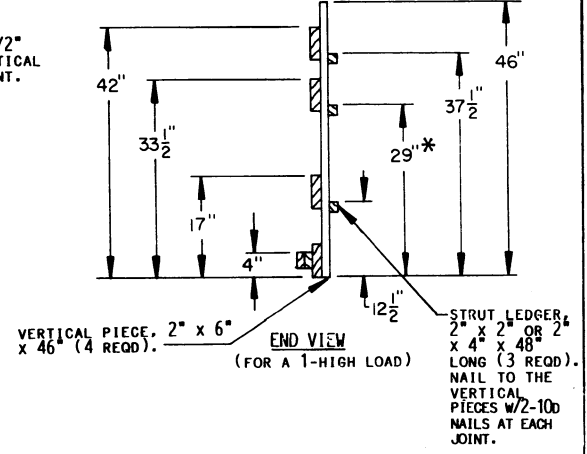
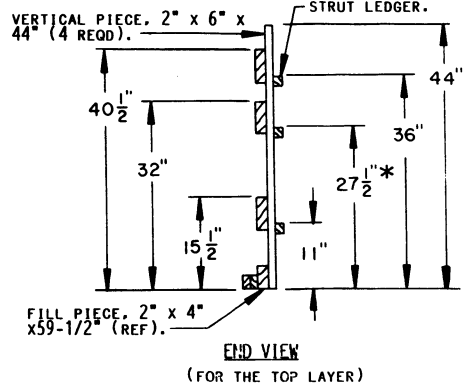
TYPICAL LCL ONE PALLET UNIT OMITTED FROM THE TOP LAYER OF A CONTAINERS-LENGTHWISE LOAD

*NOTE: THESE STRUT LEDGERS ARE NOT REQUIRED FOR USE IN 50'-6" AND 40'-6" LONG CARS.



LOAD BEARING GATE E

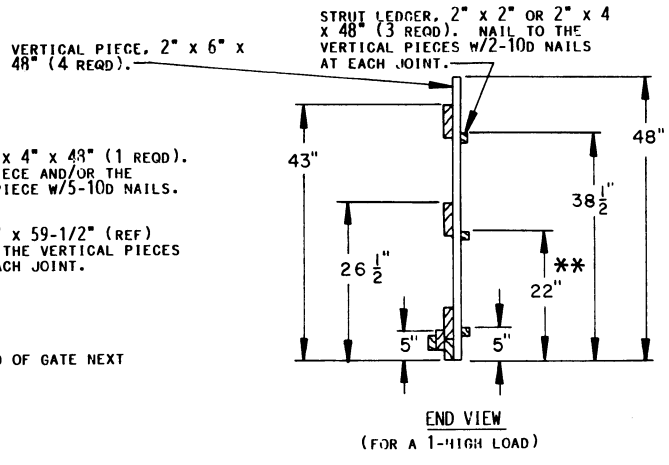
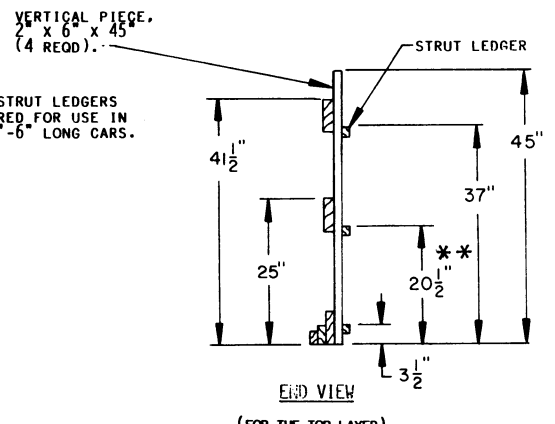
(FOR USE WITH ROUTED DUNNAGE METHOD UNITS).



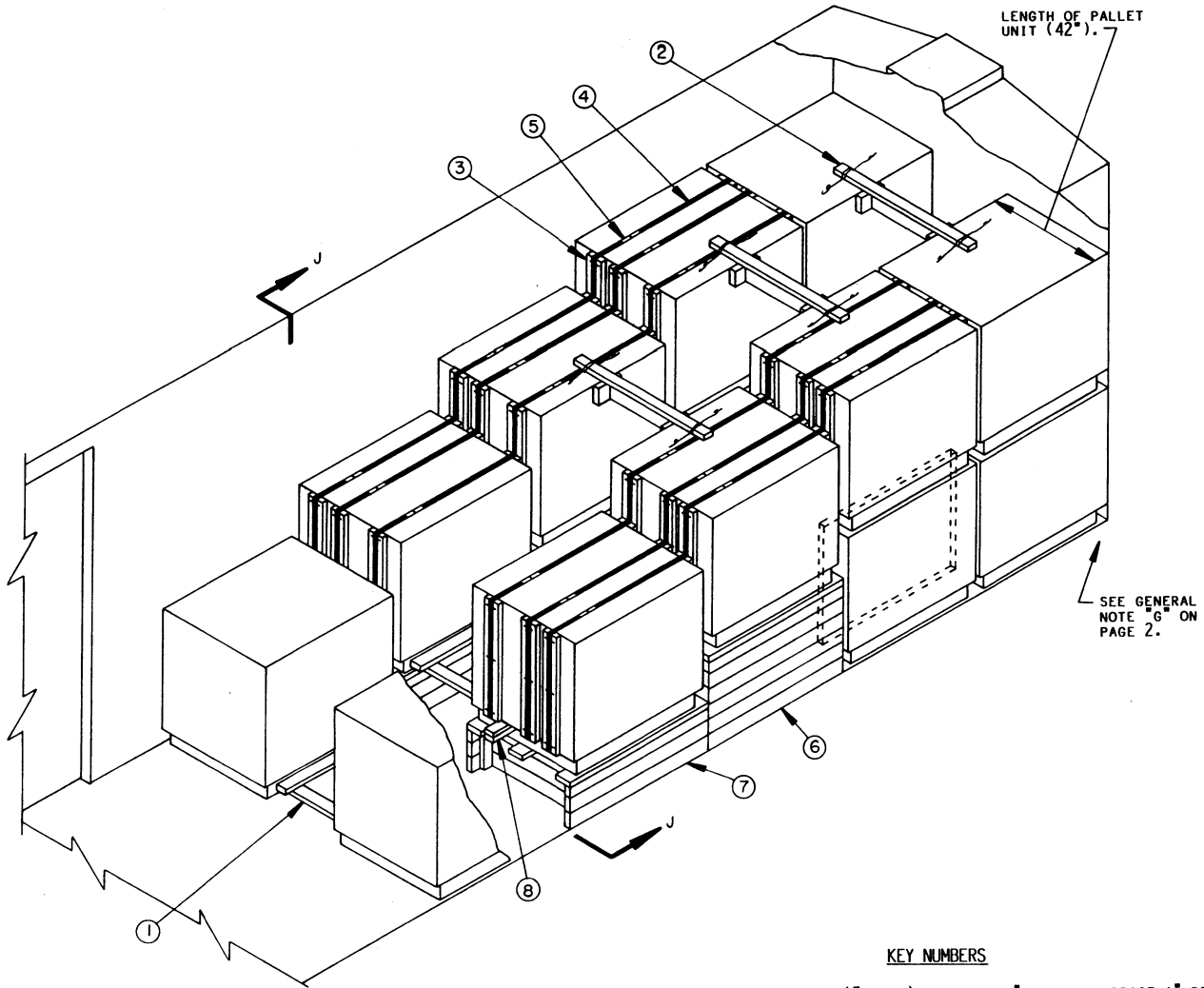
LOAD BEARING GATE F

(FOR USE WITH FLAT DUNNAGE METHOD UNIT)

**NOTE: THESE STRUT LEDGERS ARE NOT REQUIRED FOR USE IN 50'-6" AND 40'-6" LONG CARS.



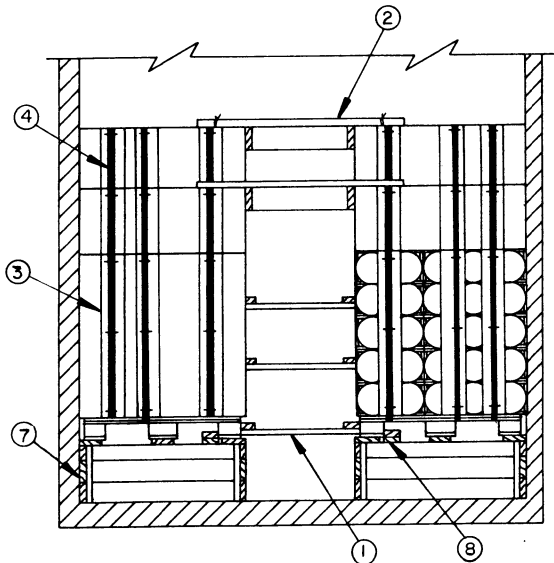
TYPICAL LCL ONE PALLET UNIT OMITTED FROM A CONTAINERS-CROSSWISE LOAD



ISOMETRIC VIEW

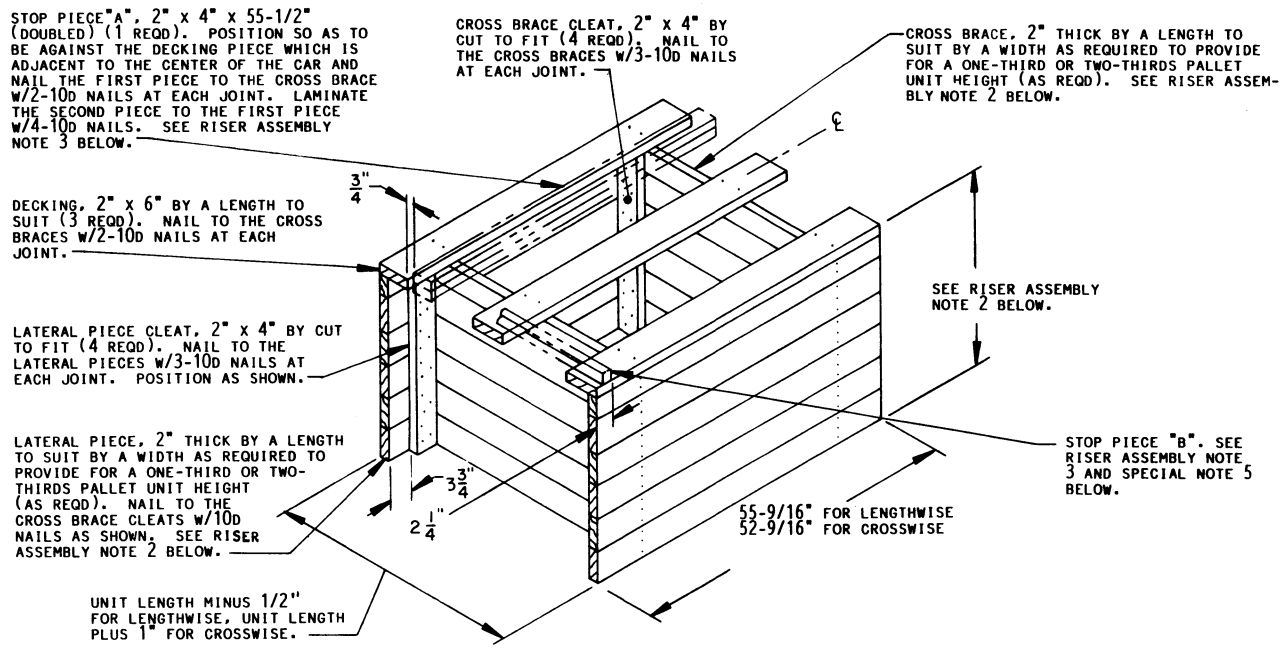
KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 49.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 68.
- ③ STRAPPING BOARD, 2" x 6" x 42" (48 REQD/6 PER PALLET UNIT). POSITION AS SHOWN IN THE "SECTION J-J" DETAIL BELOW. SEE SPECIAL NOTE 6 ON PAGE 49.
- ④ REINFORCING STRAP, 1-1/4" x .035" OR .031" X 18'-0" (REF) STEEL STRAPPING (24 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO A STRAPPING BOARD W/3 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 50.
- ⑤ SEAL FOR 1-1/4" STRAPPING (48 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑥ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 49.
- ⑦ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE ONE-THIRD OF THE PALLET UNIT HEIGHT.
- ⑧ STOP PIECE "A" (4 REQD). SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 49 FOR LOCATION AND NAILING GUIDANCE.



SECTION J-J

TYPICAL LCL USING RISER METHOD OF PARTIAL-LAYER BRACING



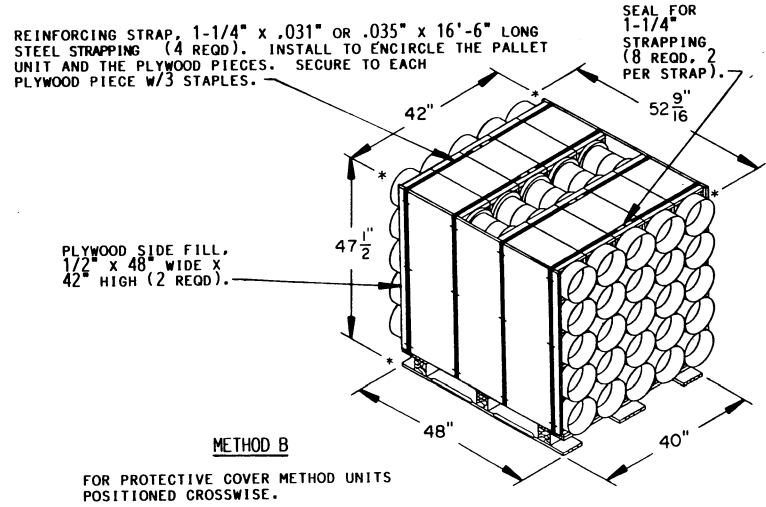
RISER ASSEMBLY

SPECIAL NOTES FOR LOAD:

1. A 9'-4" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE LOAD ON PAGE 48 IS THE PROTECTIVE COVER METHOD UNIT. THE DEPICTED PROCEDURES APPLY TO ALL UNITS COVERED BY THIS DRAWING.
3. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED LENGTHWISE IN THE CAR. WITH MODIFICATIONS, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE POSITIONED UNITS. SEE SPECIAL NOTES 5 AND 6.
4. 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.
5. ANTI-SWAY BRACE "A" IS APPLICABLE FOR THE LENGTHWISE POSITIONED UNITS. ANTI-SWAY BRACE "B" AS DETAILED ON PAGE 38, WILL BE USED FOR CROSSWISE POSITIONED UNITS.
6. FOR CROSSWISE POSITIONED UNITS, THE STRAPPING BOARDS SHOWN AS PIECE MARKED ③ WILL NOT BE REQUIRED. SEE THE "METHOD B" DETAIL BELOW AND THE "METHOD C" AND "METHOD D" DETAIL ON PAGE 50 FOR MODIFICATIONS REQUIRED IN LIEU OF USING STRAPPING BOARDS. ALSO, FOR LOADS OF CROSSWISE UNITS, EACH RISER ASSEMBLY MUST BE HELD IN PLACE BY NAILING A PIECE OF 2" x 2" BY UNIT LENGTH PLUS 1" TO THE DECKING W/2-10D NAILS AT EACH JOINT. POSITION AS SHOWN BY STOP PIECE "B" IN THE "RISER ASSEMBLY" DETAIL.
7. WHEN LOADING PALLET UNITS OF LENGTHWISE POSITIONED CONTAINERS, CARE MUST BE EXERCISED TO ENSURE THAT EACH PALLET UNIT IS POSITIONED SO THAT THE CENTER STRAPPING BOARDS ALIGN WITH THE PREVIOUSLY LOADED PALLET UNIT.

SPECIAL NOTES FOR RISER ASSEMBLY:

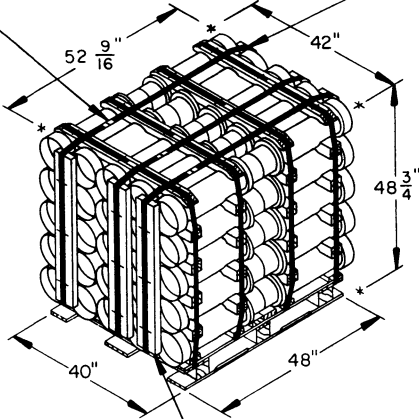
1. THE RISER ASSEMBLY SHOWN ABOVE AND AS KEY NUMBER ⑥ IN THE LOAD ON PAGE 48 IS THE TWO-THIRDS HEIGHT RISER. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FIVE (5) PIECES OF 2" x 6" MATERIAL AND ONE (1) PIECE OF 2" x 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 32-1/2" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER ⑦ IN THE LOAD ON PAGE 48, WILL BE FABRICATED FROM TWO (2) PIECES OF 2" x 6" MATERIAL AND ONE (1) PIECE OF 2" x 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE TO PROVIDE FOR A TOTAL HEIGHT OF 16" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL/CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE THIRD OR TWO THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE PALLET UNIT BEING LOADED AND THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. NOTE: AS A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT, THE ASSEMBLY DESCRIBED IN SPECIAL NOTE 1 IS APPLICABLE FOR ALL THE PALLET UNITS.
3. THE STOP PIECE "A" SHOWN ON THE RISER ASSEMBLY ABOVE IS ONLY FOR USE WHEN THE PALLET UNITS ARE POSITIONED LENGTHWISE IN THE CAR, AS SHOWN IN THE LCL LOAD ON PAGE 48. IF THE PALLET UNITS ARE POSITIONED CROSSWISE IN THE CAR, SEE SPECIAL NOTES 5 AND 6 AT LEFT FOR GUIDANCE.



TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING

SEAL FOR 1-1/4" STRAPPING (6 REQ'D, 2 PER STRAP). SEE GENERAL NOTE "O" ON PAGE 2.

REINFORCING STRAP, 1-1/4" x .031" OR .035" x 18'-0" LONG STEEL STRAPPING (3 REQ'D). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO EACH STRAPPING BOARD W/3 STAPLES.



METHOD A

FOR ALL PALLET UNITS, THE ROUTED DUNNAGE METHOD UNIT IS SHOWN.

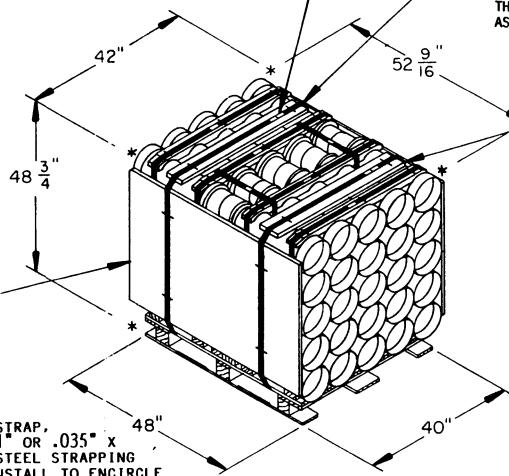
STRAPPING BOARD, 2" x 6" x 39" (6 REQ'D). POSITION SO AS TO BE CENTERED ON THE JOINTS OF CONTAINERS. SEE SPECIAL NOTE 7 ON PAGE 48.

NOTE:

THE "METHOD A" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WHICH ARE TO BE POSITIONED LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 48. THE ROUTED DUNNAGE METHOD UNIT IS SHOWN. THE PROCEDURES ARE APPLICABLE FOR ALL THE UNITS COVERED BY THIS DOCUMENT. FOR MODIFICATIONS OF UNITS TO BE POSITIONED CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL ON PAGE 48 AND/OR THE "METHOD C" DETAIL OR "METHOD D" DETAIL BELOW.

SEAL FOR 1-1/4" STRAPPING (4 REQ'D, 2 PER STRAP). SEE GENERAL NOTE "O" ON PAGE 2.

REINFORCING STRAP, 1-1/4" x .031" OR .035" x 16'-0" LONG STEEL STRAPPING (2 REQ'D). INSTALL TO ENCIRCLE THE PALLET UNIT, STRAPPING BOARD AND PLYWOOD SIDE FILL PIECES. SECURE TO THE STRAPPING BOARD AND THE SIDE FILL ASSEMBLIES W/2 STAPLES.



STRAPPING BOARD, 1" x 6" x 36" (2 REQ'D). POSITION AS SHOWN.

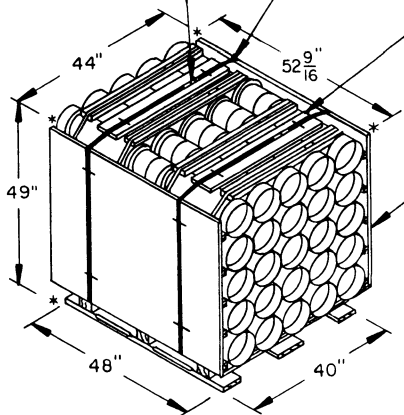
SIDE FILL ASSEMBLY (2 REQ'D). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 51.

METHOD C

FOR ROUTED DUNNAGE METHOD UNITS, CONTAINERS POSITIONED CROSSWISE.

SEAL FOR 1-1/4" STRAPPING (4 REQ'D, 2 PER STRAP). SEE GENERAL NOTE "O" ON PAGE 2.

REINFORCING STRAP, 1-1/4" x .031" OR .035" x 16'-6" LONG STEEL STRAPPING (2 REQ'D). INSTALL TO ENCIRCLE THE PALLET UNIT, STRAPPING BOARD, AND PLYWOOD SIDE FILL PIECES. SECURE TO THE STRAPPING BOARD AND SIDE FILL ASSEMBLIES W/2 STAPLES.

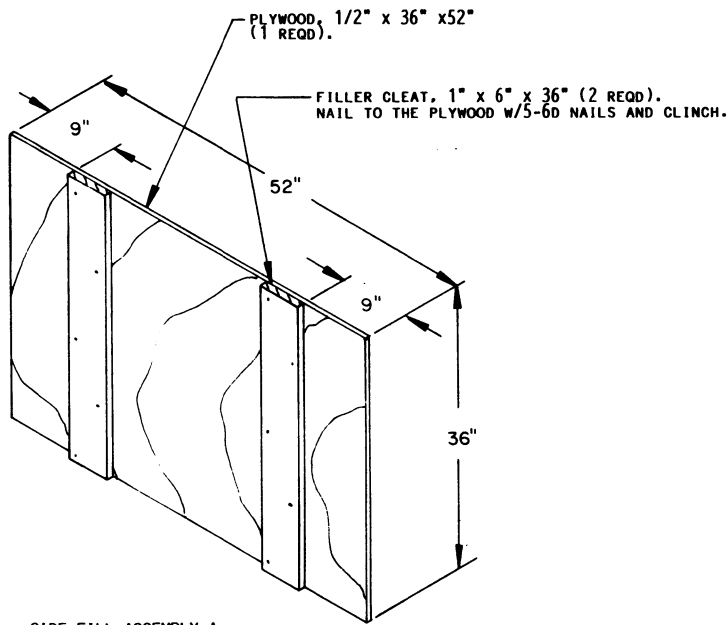


STRAPPING BOARD, 1" x 6" x 36" (2 REQ'D). POSITION AS SHOWN.

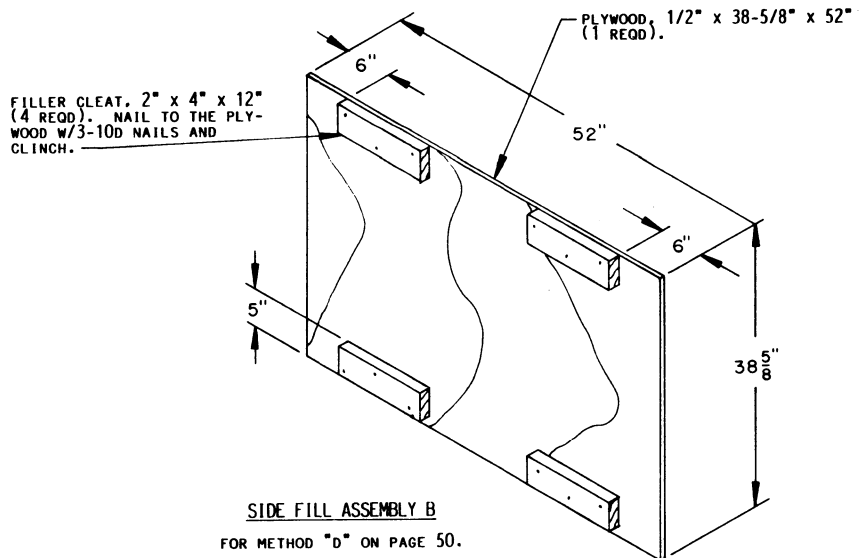
SIDE FILL ASSEMBLY (2 REQ'D). SEE THE "SIDE FILL ASSEMBLY B" DETAIL ON PAGE 51.

METHOD D

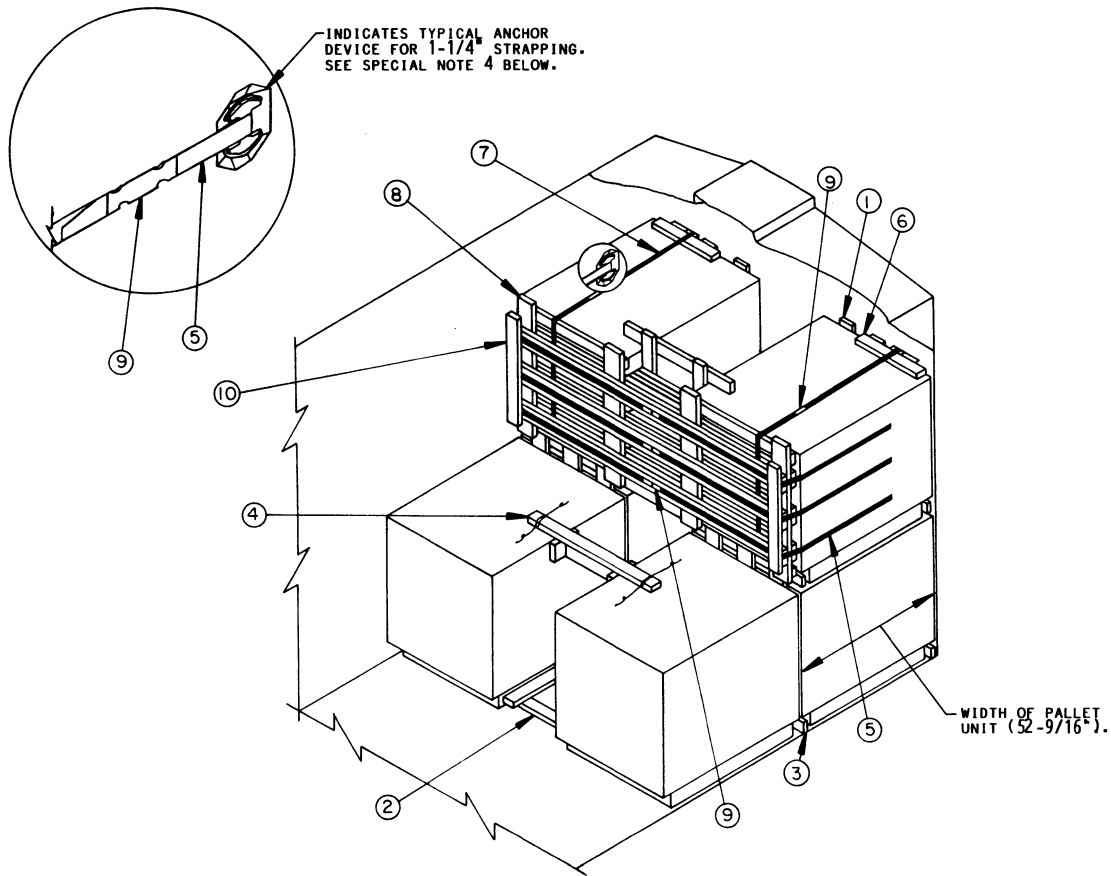
FOR FLAT DUNNAGE METHOD UNITS, CONTAINERS POSITIONED CROSSWISE.



SIDE FILL ASSEMBLY A
FOR METHOD "C" ON PAGE 50.



SIDE FILL ASSEMBLY B
FOR METHOD "D" ON PAGE 50.



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9"-2" WIDE ALL-METAL BOXCAR 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 RETAINED BY THE BULKHEAD GATE METHOD.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,500 POUNDS OF LADING. A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN A MAXIMUM OF 2 PALLET UNITS. A BULKHEAD GATE WITH 2 STRAPS WILL RETAIN A MAXIMUM OF 1 PALLET UNIT.
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 42 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 44 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 53 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.

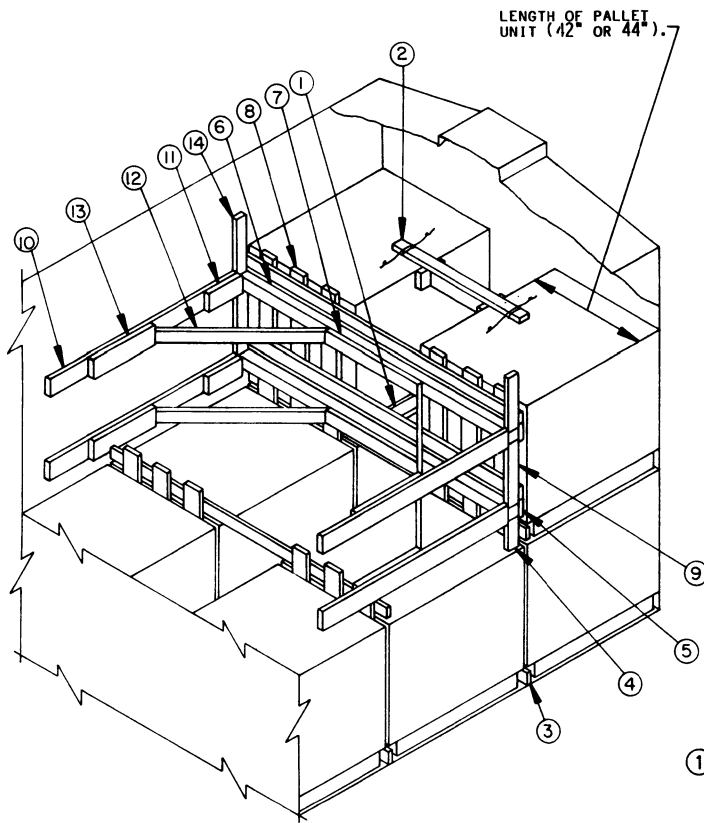
KEY NUMBERS

- ① SEPARATOR GATE FOR 2-HIGH LOAD (1 REQD). FOR THE PROTECTIVE COVER METHOD UNIT, SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 26. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 27 FOR THE ROUTED DUNNAGE METHOD UNIT OR THE "SEPARATOR GATE C" DETAIL ON PAGE 28 FOR THE FLAT DUNNAGE METHOD UNIT. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR END WALL. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS.
- ③ SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE APPLICABLE DETAIL. NOTE THAT THE VERTICAL PIECES OF THE GATE WILL BE CUT OFF EVEN WITH THE TOP OF THE UPPER TIE PIECE.
- ④ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A OR D" DETAIL ON PAGE 68.
- ⑤ 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 53 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 THRU 5 AT LEFT.
- ⑥ STRAPPING BOARD (2 REQD). SEE THE DETAIL ON PAGE 53.
- ⑦ BUNDLING STRAP, 1-1/4" x .035" x 18'-6" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED ⑥. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ⑤.
- ⑧ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 53. SEE SPECIAL NOTE 2 AT LEFT.
- ⑨ SEAL FOR 1-1/4" STEEL STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ⑤), AND ① PER BUNDLING STRAP, PIECE MARKED ⑦); DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 62.
- ⑩ 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.

(SPECIAL NOTES CONTINUED)

BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑩ IS DOUBLED.

5. 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.

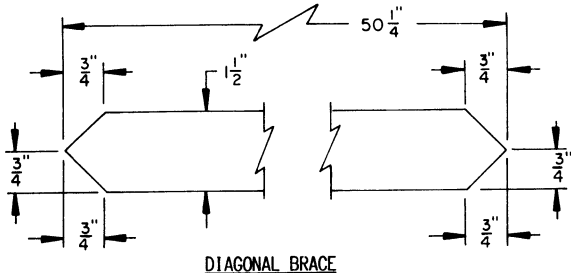


ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD LINED CARS OF OTHER WIDTHS CAN BE USED.
2. PARTIAL-LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. A LENGTHWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CROSSWISE LOADS. NOTE THAT PIECE MARKED ⑧ IS ONLY REQUIRED FOR CONTAINERS-LENGTHWISE LOADS.
3. 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. THIS WILL BE NOT MORE THAN TWO (2) UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 55 THRU 57 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
4. 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, ⑨, ⑪, AND ⑭ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑫ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑩ 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 ⑩ 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

(CONTINUED AT RIGHT)



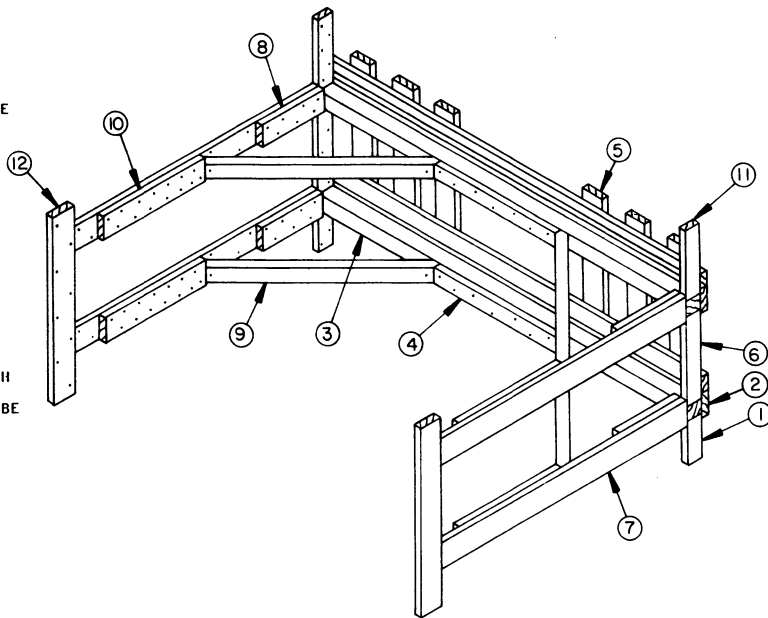
DIAGONAL BRACE

KEY NUMBERS

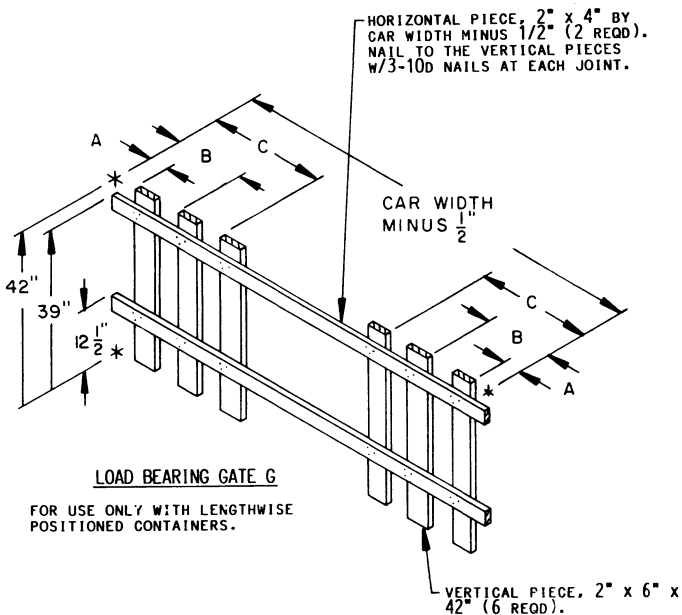
- ① ANTI-SWAY BRACE (2 REQ'D). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 38. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQ'D). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 38. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" OR "D" DETAIL ON PAGE 68. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL TIER UNITS.
- ③ SEPARATOR GATE (2 REQ'D). SEE THE APPLICABLE DETAIL ON PAGE 26, 27, OR 28 AND/OR THE ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 71.
- ④ SUPPORT CLEAT, 2" x 4" x 11" (2 REQ'D). NAIL TO THE CAR SIDEWALL W/4-12D NAILS. POSITION APPROXIMATELY 1" ABOVE THE FIRST LAYER PALLET UNIT SO AS TO CENTER PIECES MARKED ⑤ AND ⑥ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS, APPROXIMATELY 1" ABOVE THE FIRST LAYER PALLET UNIT.
- ⑤ HORIZONTAL PIECE, 2" x 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQ'D). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/1-12D NAIL EVERY 6". SEE SPECIAL NOTE 2 AT LEFT.
- ⑥ CROSS CAR BRACE 4" x 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQ'D).
- ⑦ CENTER CLEAT, 2" x 4" x 36" (2 REQ'D). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/7-16D NAILS. SEE SPECIAL NOTE 5 ABOVE.
- ⑧ LOAD BEARING GATE (1 REQ'D). SEE THE "LOAD BEARING GATE B" DETAIL ON PAGE 55. PLACE WITH HORIZONTAL PIECES ON TOP OF HORIZONTAL PIECES, PIECES MARKED ⑤, AND PROCEED WITH CONSTRUCTION OF K-BRACE. ONLY REQUIRED FOR LENGTHWISE UNITS.
- ⑨ SPACER CLEAT, 2" x 4" x 22". NAIL TO THE CAR SIDEWALL W/4-12D NAILS.
- ⑩ HORIZONTAL WALL CLEAT, 2" x 6" x 72" (4 REQ'D). NAIL TO THE CAR SIDEWALL W/16-12D NAILS.
- ⑪ POCKET CLEAT, 2" x 6" x 12" (2 REQ'D). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩ W/4-16D NAILS.
- ⑫ DIAGONAL BRACE, 2" x 4" x 50-1/4" (4 REQ'D). 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 ⑩ W/2-16D NAILS AT EACH END.
- ⑬ BACK-UP CLEAT, 2" x 6" x 24" (4 REQ'D). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩ W/8-16D NAILS.
- ⑭ HOLD-DOWN CLEAT, 2" x 4" x 18" (2 REQ'D). NAIL TO THE CAR SIDEWALL W/5-12D NAILS.

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN FOUR (4) PALLET UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 56 AND 57 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED IS ONE OR TWO PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 54 MAY BE USED.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑧, ⑩, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑦ 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 ⑦ 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 ⑦ 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 54 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW



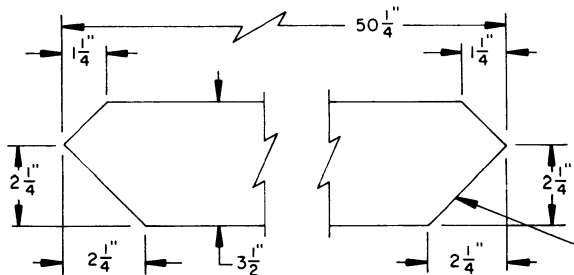
LOAD BEARING GATE G

FOR USE ONLY WITH LENGTHWISE POSITIONED CONTAINERS.

DIMENSION CHART			
DIAM	PROTECTIVE COVER	ROUTED DUNNAGE UNIT	FLAT DUNNAGE UNIT
A	5-1/2"	5-1/2"	6-1/2"
B	18"	18"	19"
C	31"	31"	32-1/2"

KEY NUMBERS

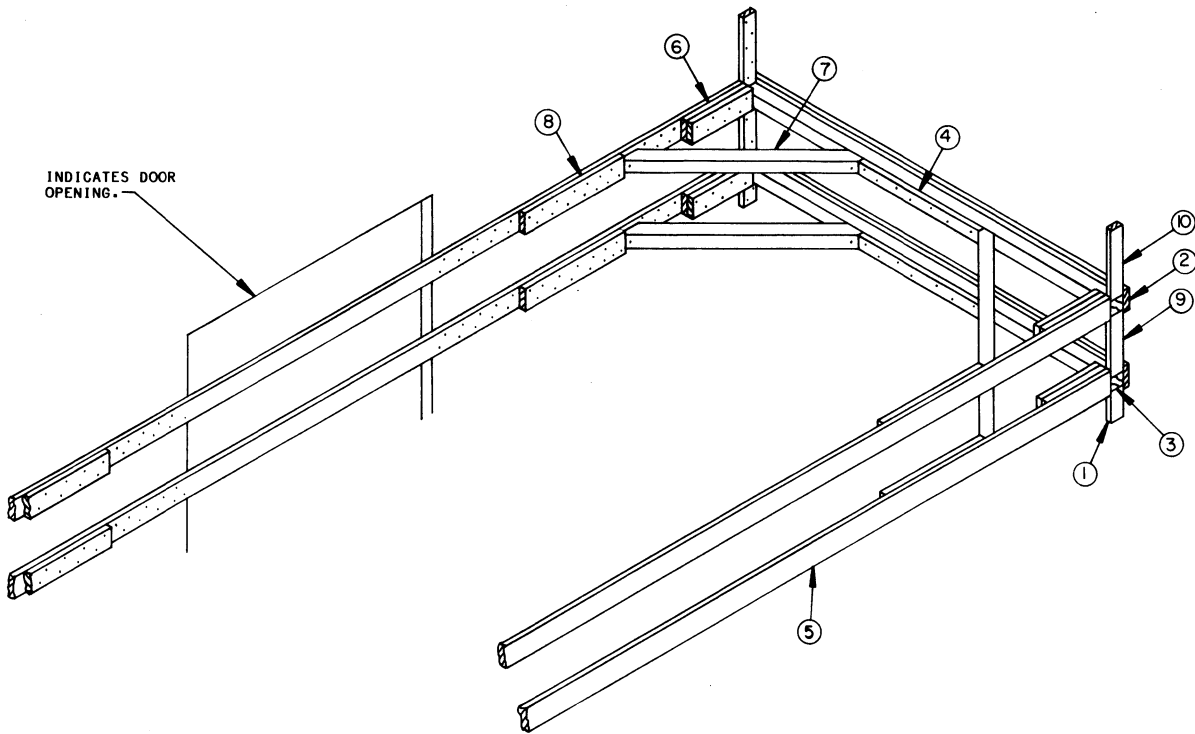
- ① SUPPORT CLEAT, 2" x 4" x 11" (2 REQD). NAIL TO THE CAR SIDEWALL w/4-12D NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2.
- ② HORIZONTAL PIECE, 2" x 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, w/1-12D NAIL EVERY 6". 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/7-16 NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ LOAD BEARING GATE (1 REQD). SEE THE "LOADING BEARING GATE G" DETAIL ON THIS PAGE. PLACE ON TOP OF HORIZONTAL PIECES, PIECES MARKED ②, AND PROCEED WITH CONSTRUCTION OF K-BRACE. ONLY REQUIRED FOR LENGTHWISE UNITS.
- ⑥ SPACER CLEAT, 2" x 4" x 22" (2 REQD). NAIL TO THE CAR SIDEWALL w/4-12D NAILS.
- ⑦ HORIZONTAL WALL CLEAT, 2" x 6" x 72" (4 REQD). NAIL TO THE CAR SIDEWALL w/16-12D NAILS.
- ⑧ POCKET CLEAT, 2" x 6" x 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, w/7-16D NAILS.
- ⑨ 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 ⑦, w/1-60D NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" x 6" x 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑦, w/14-16D NAILS.
- ⑪ HOLD DOWN CLEAT, 2" x 4" x 18" (2 REQD). NAIL TO THE CAR SIDEWALL w/5-12D NAILS.
- ⑫ VERTICAL BACK-UP CLEAT, 2" x 6" x 48" (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 ⑦.

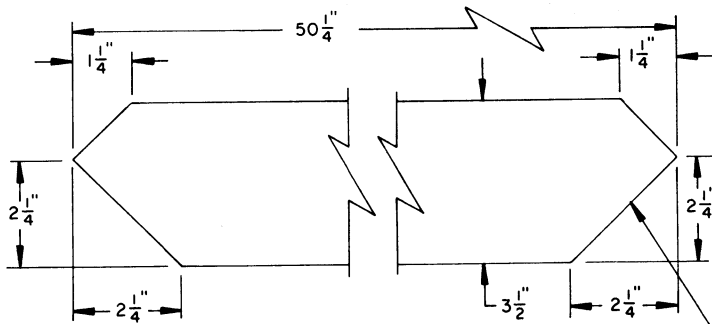


ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN SIX(6) FLAT OR ROUTED DUNNAGE METHOD PALLET UNITS. DO NOT USE FOR SIX (6) PROTECTIVE COVER METHOD UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 57 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED IS THREE OR FOUR PALLET UNITS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 55 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED IS ONE OR TWO PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 54 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, AND ⑩ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST w/40-16D NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.

(CONTINUED AT RIGHT)



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE

KEY NUMBERS

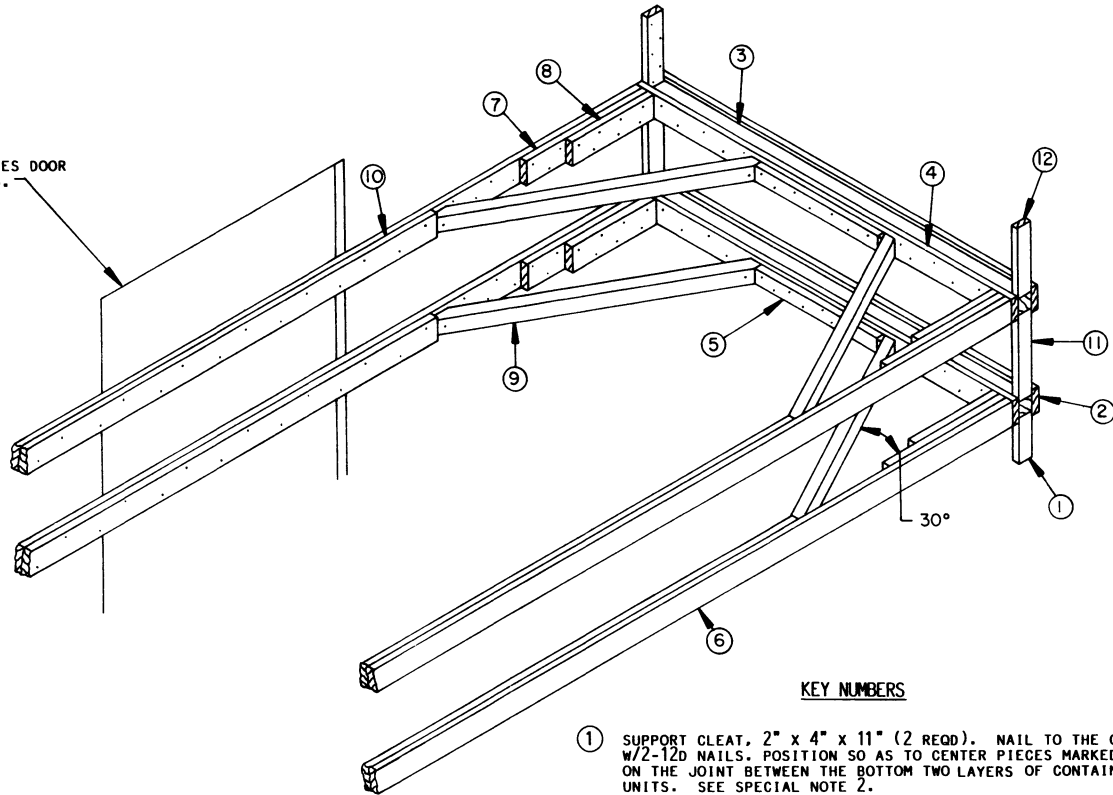
- ① SUPPORT CLEAT, 2" x 4" x 11" (2 REQD). NAIL TO THE CAR SIDEWALL w/7-12D NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2.
- ② LOAD BEARING PIECE, 2" x 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE 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 22" (2 REQD). NAIL TO THE CAR SIDEWALL w/4-12D NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" x 4" x 18" (2 REQD). NAIL TO THE CAR SIDEWALL w/5-12D NAILS.

(SPECIAL NOTES CONTINUED)

3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2" , AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

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

INDICATES DOOR
OPENING.

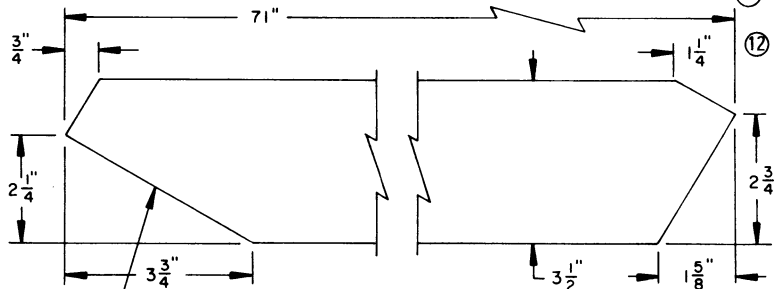


KEY NUMBERS

- ① SUPPORT CLEAT, 2" x 4" x 11" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12D 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.
- 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 22" (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.

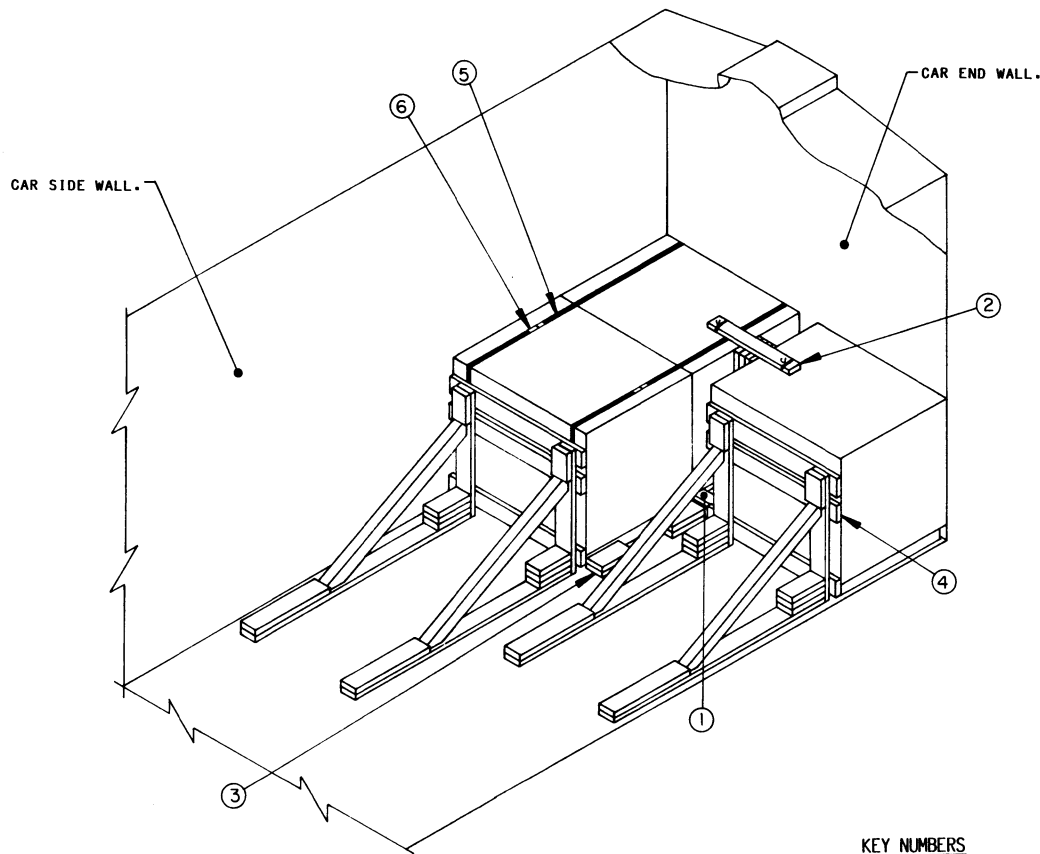
SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN SIX (6) PROTECTIVE COVER METHOD UNITS OR EIGHT (8) FLAT OR ROUTED DUNNAGE METHOD UNITS. IF THE PARTIAL TIER IS NOT MORE THAN SIX FLAT OR ROUTED DUNNAGE UNITS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 56 MAY BE USED. IF A PARTIAL TIER CONSISTS OF NOT MORE THAN FOUR PALLET UNITS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 55 MAY BE USED. IF ONLY ONE OR TWO PALLET UNITS ARE TO BE BRACED IN THE PARTIAL TIER, THE TYPE "A" BRACE ON PAGE 54 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑩, 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.



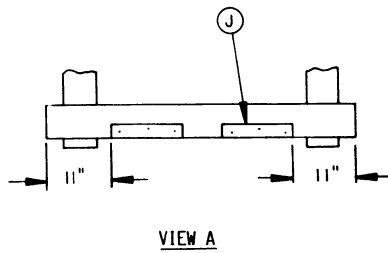
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

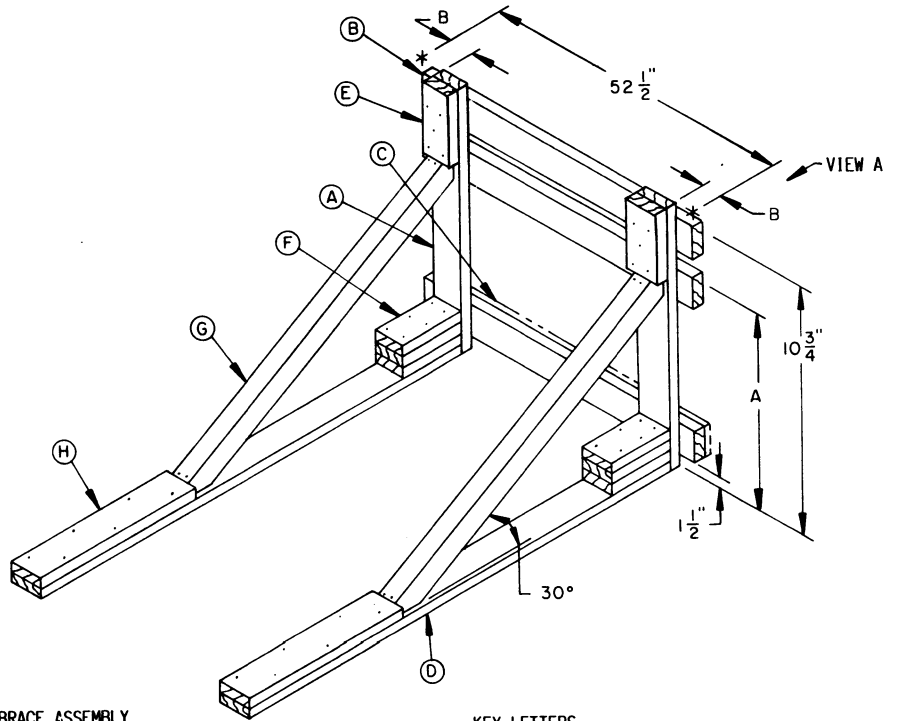
1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE PROTECTIVE COVER METHOD UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE ROUTED DUNNAGE AND FLAT DUNNAGE METHOD UNITS.
3. 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 4 ARE NOT EXCEEDED. POSITION PALLET UNITS WITH THE CONTAINERS-CROSSWISE ONLY, DO NOT POSITION WITH CONTAINERS-LENGTHWISE.
4. 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 TWO (2) PALLET UNITS.

- ① ANTI-SWAY BRACE (1 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 38. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 38. WIRE TIE TO THE PALLET UNIT RETAINER STRAP OR THE STRAPPING BOARD, AS APPLICABLE, WITH NO. 14 GAGE WIRE. SEE THE "TIE WIRE APPLICATION B" OR "C" DETAIL ON PAGE 68.
- ③ SIDE BLOCKING, 2" x 6" x 12" (DOUBLED) (2 REQD). POSITION AS SHOWN WITH ONE AT EACH END OF THE UNIT. NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16D NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ④ KNEE BRACE ASSEMBLY (2 REQD). SEE THE "KNEE BRACE ASSEMBLY" DETAIL ON PAGE 59.
- ⑤ BUNDLING STRAP, 1-1/4" x .035" OR .031" x 23'-6" LONG STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.



VIEW A

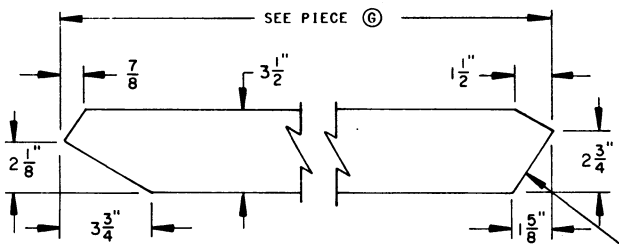
DIMENSION CHART		
PALLET UNIT	DIM A	DIM B
PROTECTIVE COVER METHOD UNIT	33"	3-1/4"
ROUTED DUNNAGE METHOD UNIT	33-1/2"	3"
FLAT DUNNAGE METHOD UNIT	34"	2-1/2"



KNEE BRACE ASSEMBLY

KEY LETTERS

- (A) VERTICAL PIECE, 2" x 6" BY DIMENSION "A" PLUS 10-3/4" (2 REQD). SEE THE CHART AT LEFT FOR PLACEMENT DIMENSIONS. NAIL TO THE FLOOR CLEAT W/2-16D NAILS.
- (B) HORIZONTAL PIECE, 2" x 6" x 52-1/2" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10D NAILS AT EACH JOINT. SEE GENERAL NOTES "M" AND "N" ON PAGE 2.
- (C) HORIZONTAL PIECE, 1" x 6" x 52-1/2" (1 REQD FOR ROUTED DUNNAGE METHOD UNITS ONLY). NAIL TO THE BOTTOM HORIZONTAL PIECE MARKED (B) W/1-6D NAIL EVERY 12".
- (D) FLOOR CLEAT, 2" x 6" x 7'-2" (2 REQD). NAIL TO THE CAR FLOOR W/1-16D NAIL EVERY 8". SEE GENERAL NOTE "5" ON PAGE 2.
- (E) HOLD DOWN CLEAT, 2" x 6" x 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10D NAILS.
- (F) POCKET CLEAT, 2" x 6" x 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (D), W/5-16D 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.
- (G) BRACE, 4" x 4" x 60-1/2" FOR PROTECTIVE COVER METHOD, 61-1/2" FOR ROUTED DUNNAGE METHOD UNITS, 62-1/2" FOR FLAT DUNNAGE METHOD UNITS. SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECES AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (D), W/2-16D NAILS AT EACH END.
- (H) BACK-UP CLEAT, 2" x 6" x 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (D), W/6-40D NAILS.
- (J) GATE HOLD DOWN, 2" x 3" x 12" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL PIECE W/3-10D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.



BRACE

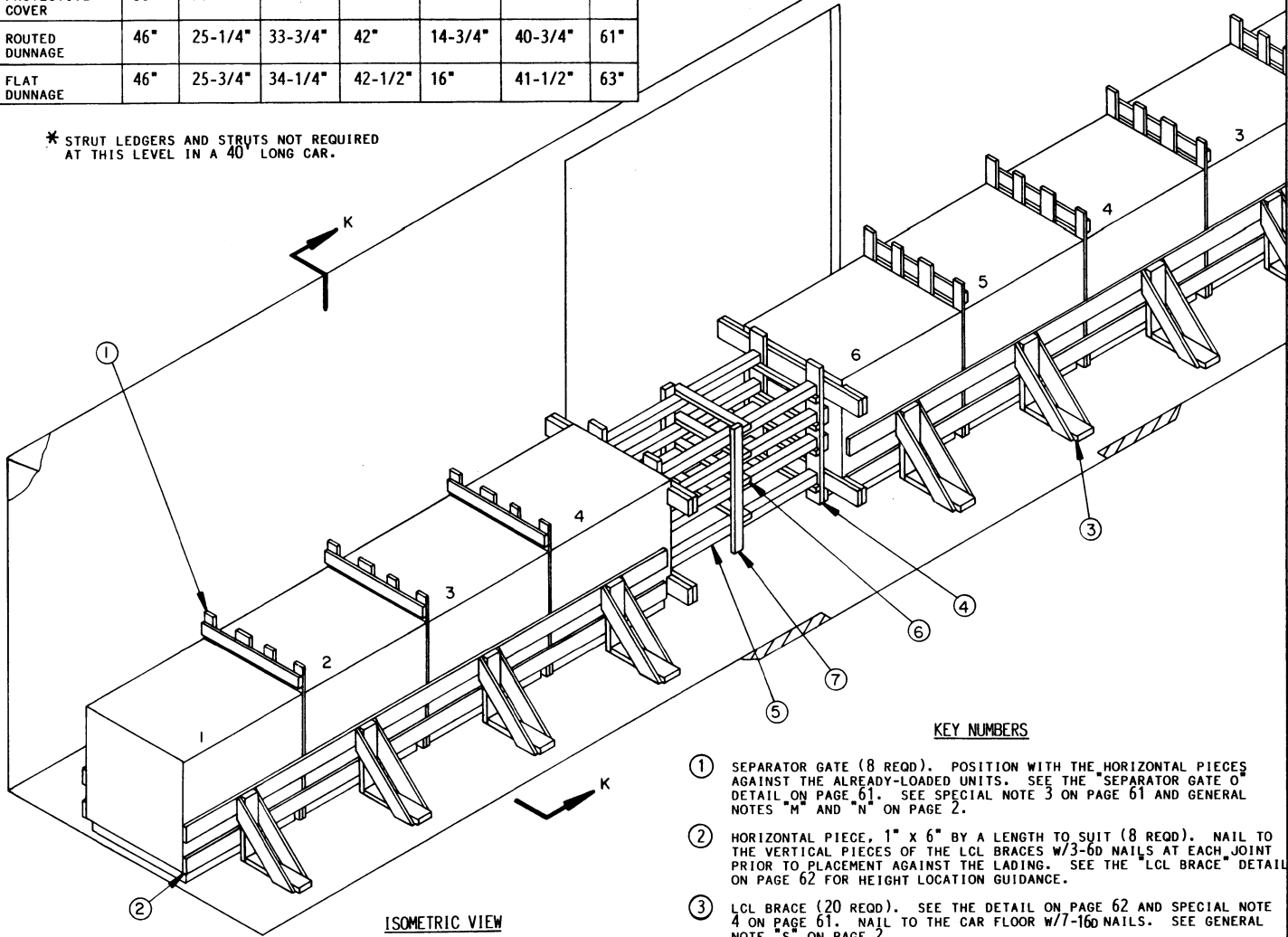
4" x 4" MATERIAL

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

CONTAINERS-LENGTHWISE DIMENSION CHART

PALLET UNIT	A	B*	C	D	E	F	G
PROTECTIVE COVER	50"	25"	33-1/2"	46"	15-1/4"	40-1/4"	61"
ROUTED DUNNAGE	46"	25-1/4"	33-3/4"	42"	14-3/4"	40-3/4"	61"
FLAT DUNNAGE	46"	25-3/4"	34-1/4"	42-1/2"	16"	41-1/2"	63"

* STRUT LEDGERS AND STRUTS NOT REQUIRED AT THIS LEVEL IN A 40' LONG CAR.

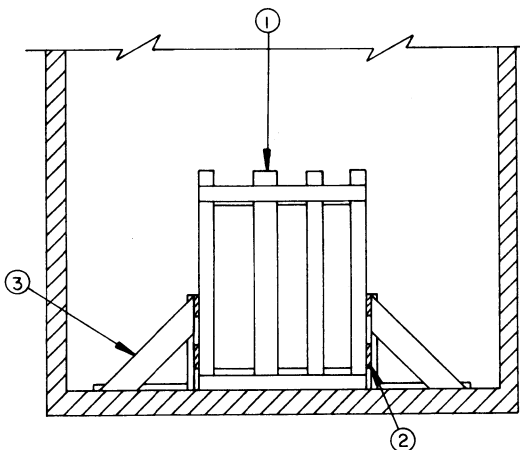


ISOMETRIC VIEW

SEE GENERAL NOTES "D" AND "6" ON PAGE 2.

KEY NUMBERS

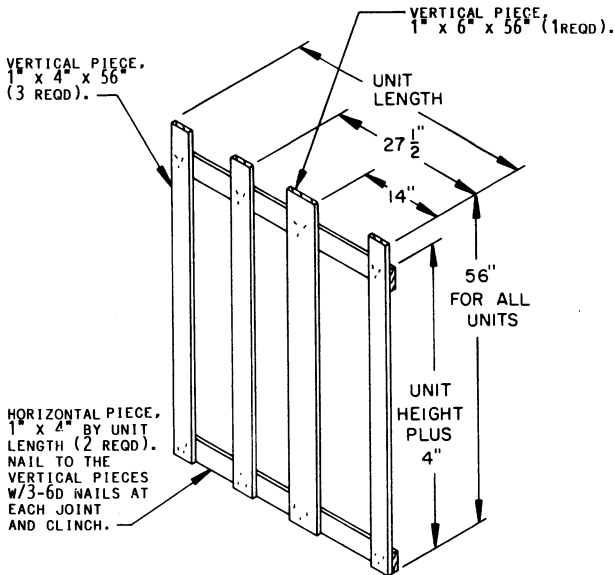
- ① SEPARATOR GATE (8 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "SEPARATOR GATE O" DETAIL ON PAGE 61. SEE SPECIAL NOTE 3 ON PAGE 61 AND GENERAL NOTES "M" AND "N" ON PAGE 2.
- ② HORIZONTAL PIECE, 1" x 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6D NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 62 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE (20 REQD). SEE THE DETAIL ON PAGE 62 AND SPECIAL NOTE 4 ON PAGE 61. NAIL TO THE CAR FLOOR W/7-16D NAILS. SEE GENERAL NOTE "S" ON PAGE 2.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE P" OR THE "CENTER GATE Q" DETAIL ON PAGE 61 FOR LENGTHWISE OR CROSSWISE UNITS, RESPECTIVELY. FOR THE HOLD DOWN PIECES SIZE AND LOCATION, REFER TO "CENTER GATE G" ON PAGE 32 FOR THE PROTECTIVE COVER METHOD UNIT, "CENTER GATE H" FOR THE ROUTED DUNNAGE METHOD UNIT AND "CENTER GATE J" FOR THE FLAT DUNNAGE METHOD UNIT ON PAGE 33.
- ⑤ STRUT, 4" x 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED ④ W/2-16D NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 2.
- ⑥ HORIZONTAL STRUT BRACING, 2" x 4" x 32" (4 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤, W/3-10D NAILS AT EACH JOINT.
- ⑦ VERTICAL STRUT BRACING, 2" x 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤, W/3-10D NAILS AT EACH JOINT.



SECTION K-K

CONTAINERS-CROSSWISE DIMENSION CHART

PALLET UNIT	H	J	K	L	M	N
PROTECTIVE COVER	46"	16-3/4"	29-1/4"	42"	25"	41"
ROUTED DUNNAGE	46"	17"	33-1/2"	42"	25-1/2"	40-1/2"
FLAT DUNNAGE	48"	NA	26-1/2"	43"	25-1/2"	40-1/2"



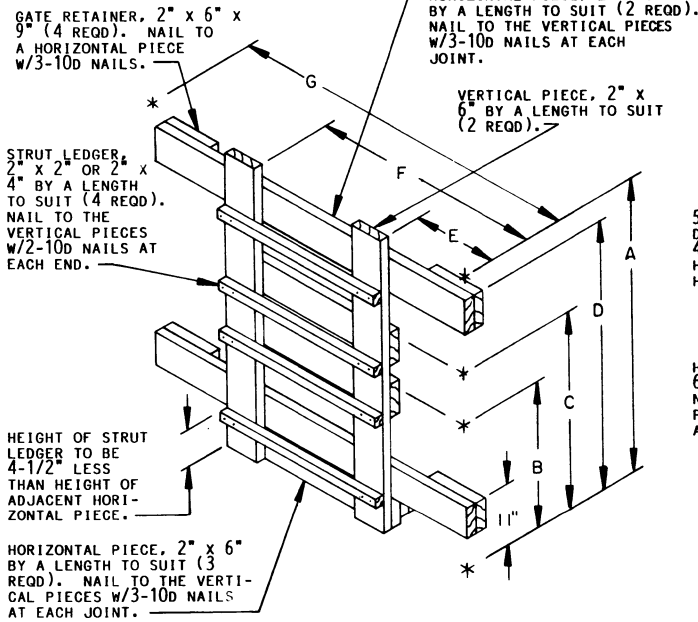
FLAT DUNNAGE METHOD UNIT
*15"
**28-1/2"

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND LENGTHS CAN BE USED.
2. A 1-WIDE CONTAINERS-LENGTHWISE LOAD OF PROTECTIVE COVER METHOD PALLET UNITS IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR A 1-WIDE LOAD CONTAINERS-CROSSWISE LOAD. THESE PROCEDURES APPLY TO ALL UNITS WITHIN THIS DRAWING.
3. SEPARATOR GATES, PIECES MARKED ①, ARE NOT REQUIRED AND THE QUANTITY OF LCL BRACES, PIECES MARKED ③, IS NOT CORRECT FOR CROSSWISE LOADS.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. FOR CROSSWISE PALLET UNITS, THE BRACES WILL BE CENTERED ON THE LENGTH OF THE UNIT. FOR THE LENGTHWISE UNITS, THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE UNIT WIDTH.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.

SEPARATOR GATE O

FOR PROTECTIVE COVER AND ROUTED DUNNAGE UNITS

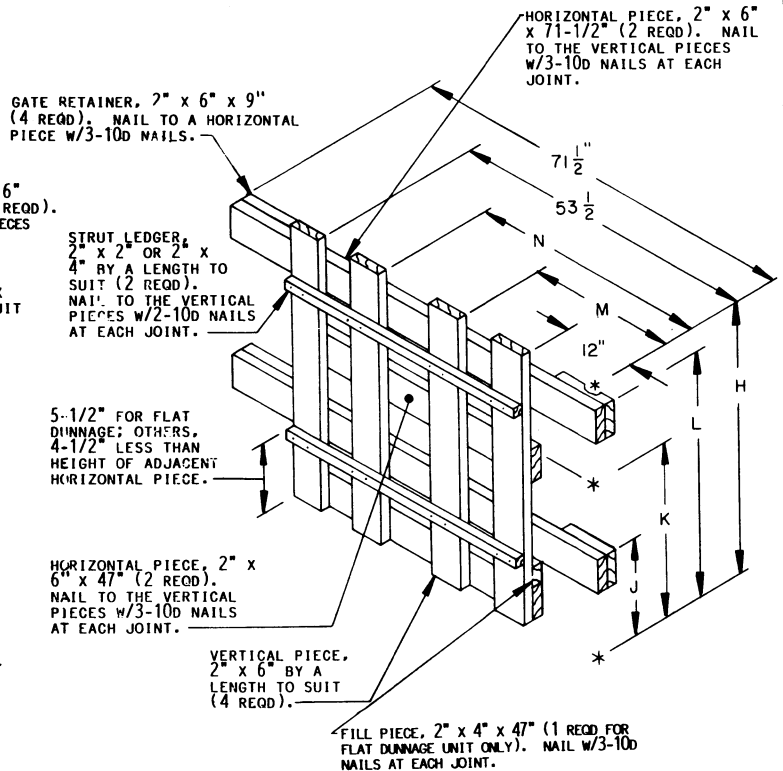


CENTER GATE P

THIS GATE IS FOR USE WITH LENGTHWISE-POSITIONED CONTAINERS. SEE THE CHART AT TOP OF PAGE 60 FOR DIMENSIONS. REFER TO KEY NUMBER ④ ON PAGE 60 FOR REFERENCE TO HOLD DOWN PIECE SIZE AND PLACEMENT.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" x 3"	4	2
1" x 4"	112	38
1" x 6"	327	164
2" x 2"	22	8
2" x 3"	4	2
2" x 4"	19	13
2" x 6"	59	59
4" x 4"	46	62
NAILS	NO. REQD	POUNDS
6d (2")	324	2
8d (2-1/2")	264	3
10d (3-1/2")	141	2-1/4
16d (3-1/2")	222	5



CENTER GATE Q

THIS GATE IS FOR USE WITH CROSSWISE-POSITIONED CONTAINERS. FOR THE SIZE AND PLACEMENT OF CENTER GATE HOLD DOWN PIECES, REFER TO THE FOLLOWING CENTER GATE DETAILS:

PROTECTIVE COVER METHOD-----CENTER GATE K-----PAGE 34
ROUTED DUNNAGE METHOD-----CENTER GATE L-----PAGE 34
FLAT DUNNAGE METHOD-----CENTER GATE M-----PAGE 35

FOR ALL OTHER DIMENSIONS, REFER TO THE CHART AT BOTTOM OF PAGE 60. NOTE THAT STRUT LEDGERS AND STRUTS REQUIRED AT DIMENSION "K" ONLY IN A 60' LONG CAR.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	10	35,040 LBS
DUNNAGE-----		709 LBS
TOTAL WEIGHT-----		35,749 LBS

HORIZONTAL PIECE, 1" x 6" x 52" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6D NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST LADING.

HORIZONTAL PIECE, 1" x 6" x 42" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6D NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST LADING.

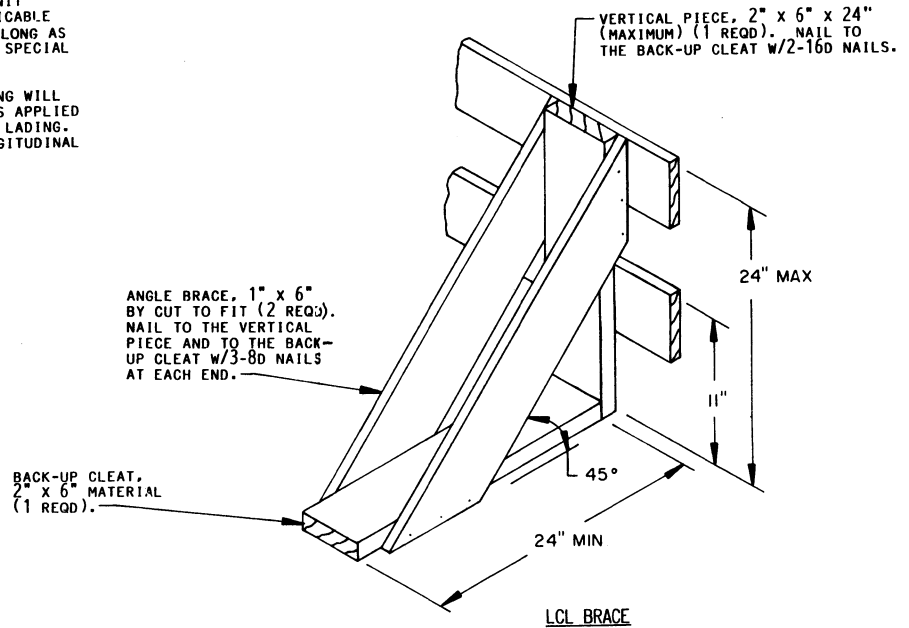
SEE GENERAL NOTE "G" ON PAGE 2.

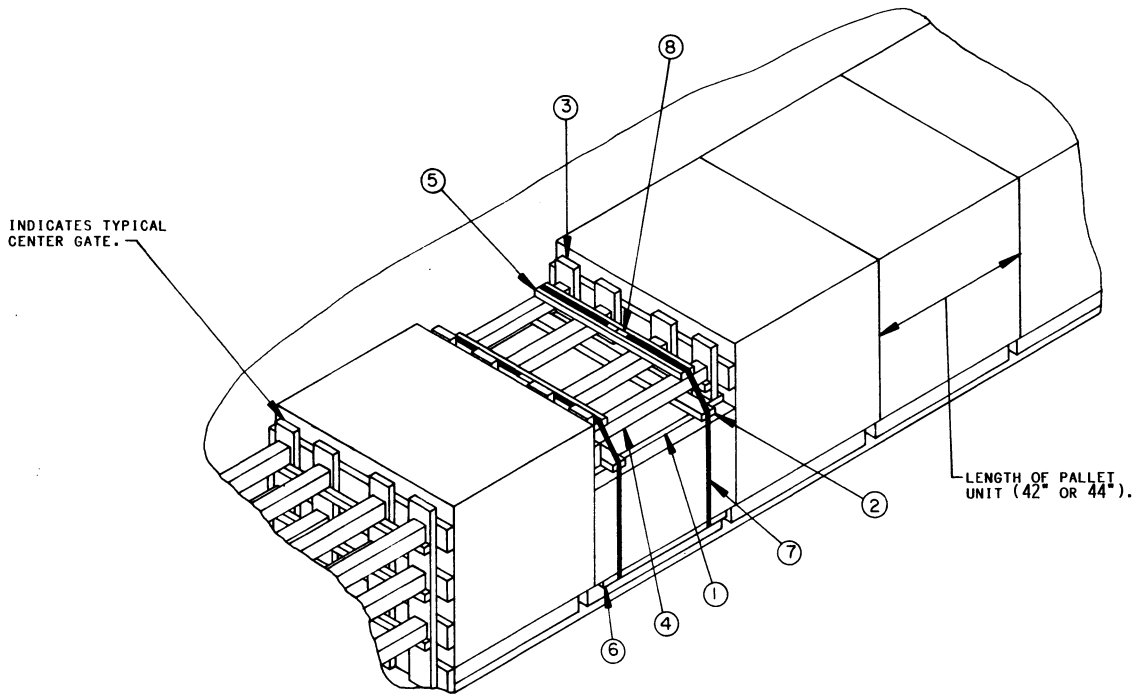
LCL BRACE (4 REQD). SEE THE DETAIL BELOW. LOCATE SO AS TO BE CENTERED ON THE JOINTS OF THE CONTAINER ENDS. FOR CROSSWISE CONTAINERS, POSITION AGAINST THE OUTER END OF EACH PROTECTIVE COVER OR AGAINST THE OUTER DUNNAGE PIECES OF THE ROUTED OR FLAT DUNNAGE METHOD UNITS.

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 "S" AND "D" ON PAGE 2.
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A CROSSWISE UNIT IS SHOWN, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LENGTHWISE UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3.
3. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE IS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.





POSITIONING OF PARTIAL CROSSWISE UNIT IN A LAYER

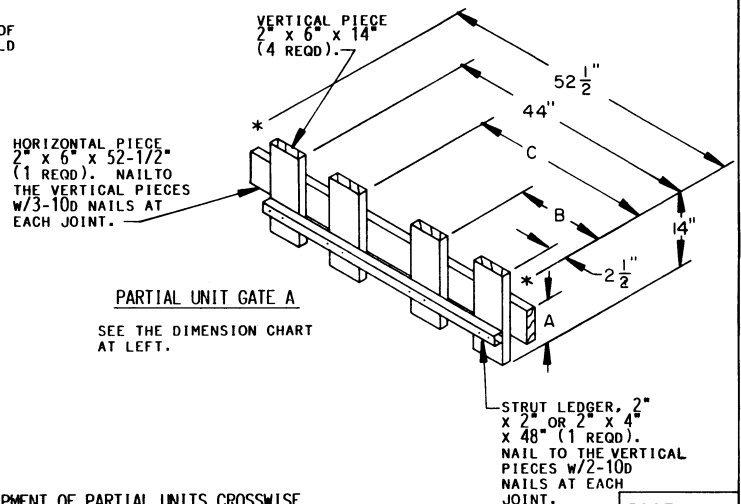
SPECIAL NOTES:

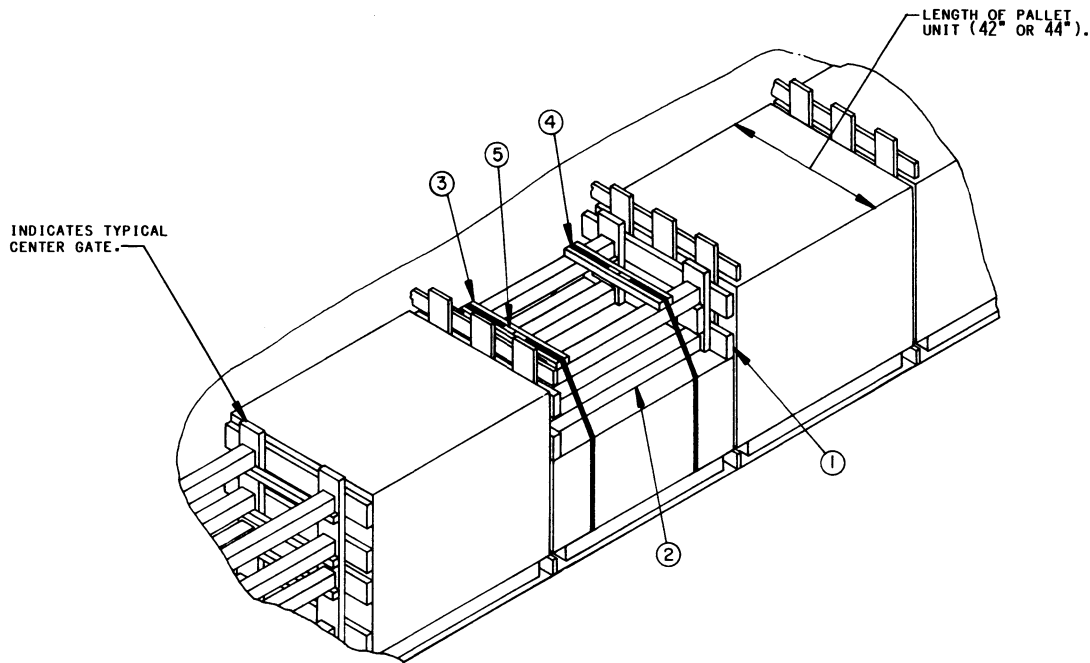
1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CROSSWISE LOAD.
2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE ROUTED DUNNAGE METHOD UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DRAWING.
3. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CROSSWISE-POSITIONED COMPLETE ROUNDS 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. FOR THE SHIPMENT OF ONE OR TWO LAYERS ON A PARTIAL UNIT, SEE THE PROCEDURES ON PAGE 66.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/11-20PM1002, MUST BE INSTALLED IN PLACE OF THE OMITTED CONTAINERS.
5. THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 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.
6. THE "POSITIONING OF PARTIAL CROSSWISE UNIT IN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
7. 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 SUPPORT PIECE, 2" x 6" x 42" FOR PROTECTIVE COVER AND ROUTED DUNNAGE METHOD UNITS, 44" FOR FLAT DUNNAGE METHOD UNITS (2 REQD). POSITION SO AS TO BE UNDER THE TWO OUTSIDE VERTICAL PIECES OF THE PARTIAL UNIT GATES, PIECE MARKED ③.
- ② RETAINER PIECE, 2" x 4" x 52-1/2" (2 REQD). NAIL TO THE SUPPORT PIECES, PIECES MARKED ①, W/2-10D NAILS AT EACH JOINT.
- ③ PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ④ STRUT, 4" x 4" x 36" FOR PROTECTIVE COVER AND ROUTED DUNNAGE METHOD UNITS, 38" FOR FLAT DUNNAGE METHOD UNITS (4 REQD). TOENAIL TO THE PARTIAL-UNIT GATE, PIECE MARKED ③ W/2-16D NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" x 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ④, W/2-10D NAILS AT EACH JOINT.
- ⑥ BATTEN, 2" x 2-1/2" (ACTUAL SIZE) BY A LENGTH TO SUIT (2 REQD). POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.
- ⑦ UNITIZING STRAP, 1-1/4" x .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.

DIMENSION CHART			
PALLET UNIT	A	B	C
PROTECTIVE COVER UNIT	9-3/4"	15-1/2"	31-1/2"
ROUTED DUNNAGE UNIT	8-1/2"	16"	31"
FLAT DUNNAGE UNIT	9"	16"	31"





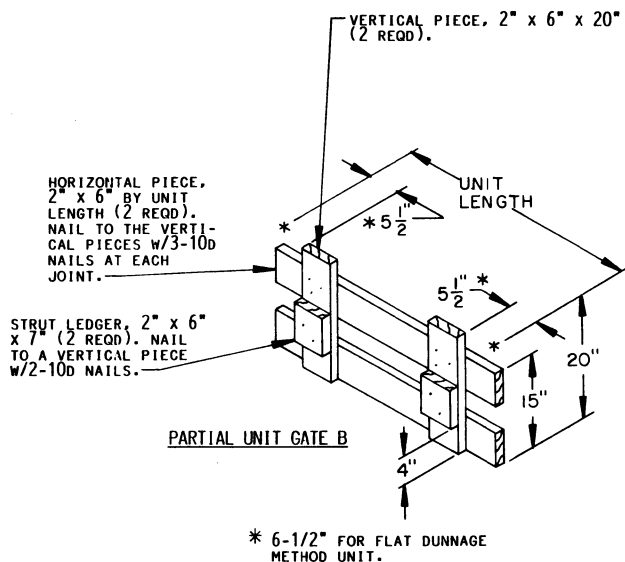
POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER

SPECIAL NOTES:

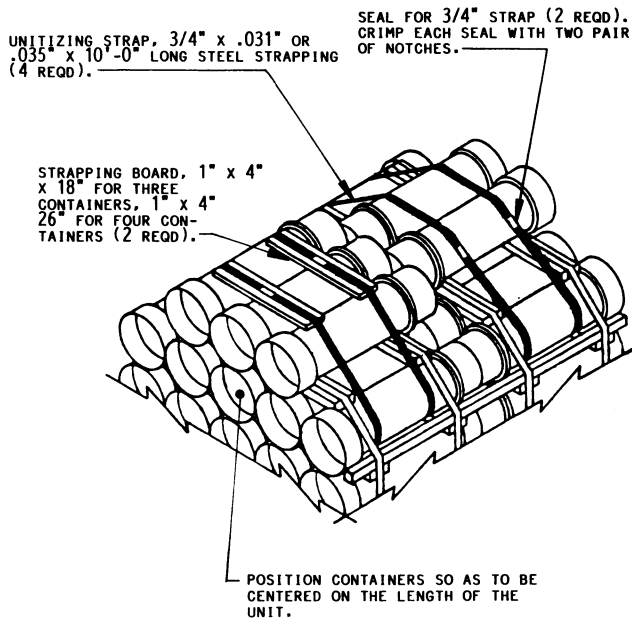
1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LENGTHWISE LOAD.
2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE PROTECTIVE COVER METHOD UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DRAWING.
3. A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A 5-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FIVE (5) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/11-20PM1002 MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
5. THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 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.
6. 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.
7. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

- ① PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTES "M" AND "N" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② STRUT, 4" x 4" x 46-1/2" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED ①, W/2-16D NAILS AT EACH END.
- ③ STRAPPING BOARD, 2" x 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/2-10D NAILS AT EACH END.
- ④ UNITIZING STRAP, 1-1/4" x .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE PALLET.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.



PROCEDURES FOR SHIPMENT OF PARTIAL UNITS LENGTHWISE

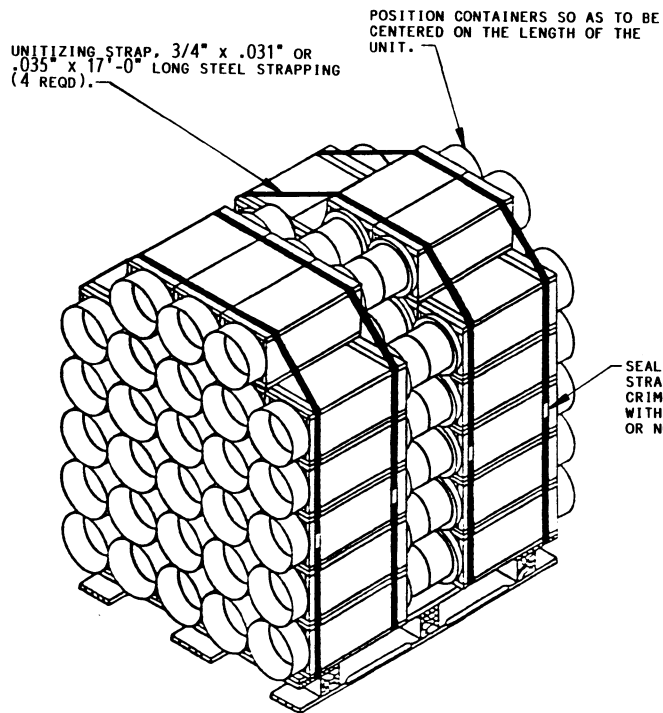


SECUREMENT OF FIVE CONTAINERS

FLAT DUNNAGE METHOD UNIT SHOWN AS TYPICAL. NOTE THAT A STRAPPING BOARD IS REQUIRED FOR THREE OF FOUR CONTAINERS.

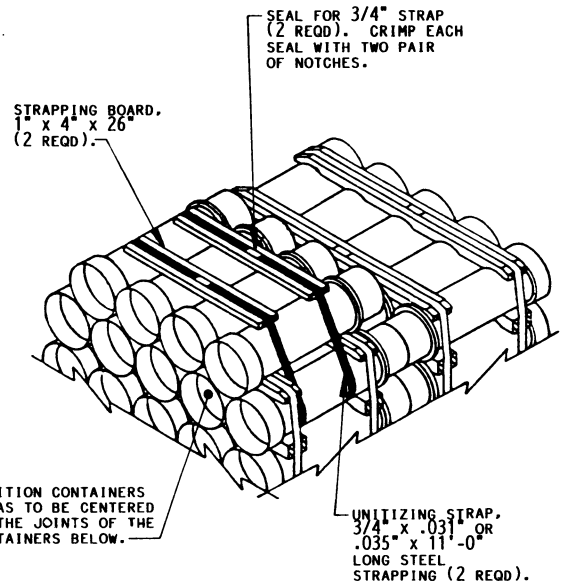
SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT EITHER ON TOP OF A LOAD AS SHOWN ON PAGE 66 OR WITHIN A LAYER AS SHOWN ON PAGES 63 AND 64.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE AND PACK PLANTS TO DEPOTS. **CAUTION:** A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE UNITIZING STRAP MUST NOT GO AROUND THE INTERMEDIATE DUNNAGE ASSEMBLY FOR THE FLAT DUNNAGE METHOD UNITS. THE STRAP MUST BE THREADED BEHIND THE 2" x 2" PIECES OF THE ASSEMBLIES AS SHOWN AT LEFT.
4. 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.
5. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.



SECUREMENT OF FIVE CONTAINERS

PROTECTIVE COVER METHOD UNIT SHOWN AS TYPICAL.



SECUREMENT OF FOUR CONTAINER

ROUTED DUNNAGE METHOD UNIT SHOWN AS TYPICAL.

SEAL FOR 3/4" STRAP (4 REQD). CRIMP EACH SEAL WITH TWO PAIR OR NOTCHES.

INDICATES TWO (2)
1-1/4" STRAP SEALS.

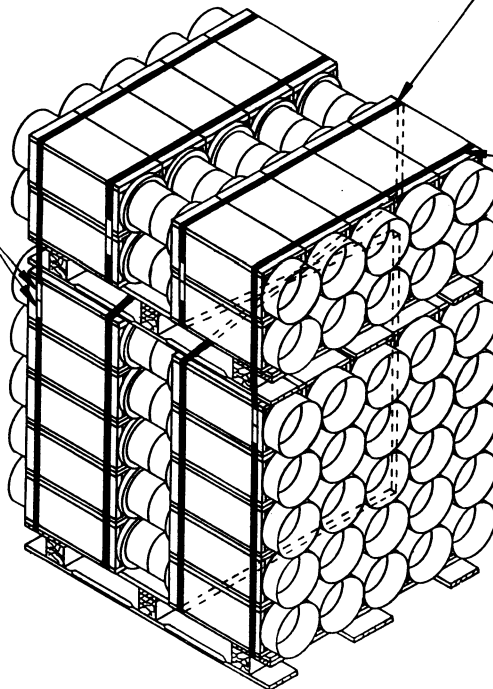
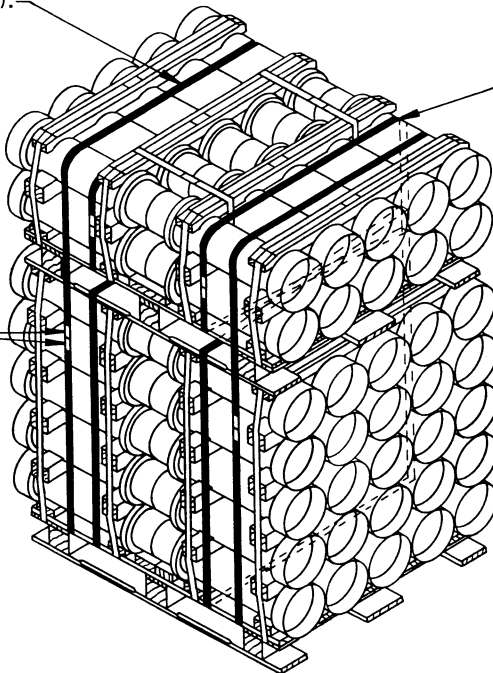


FIGURE-8 UNITIZING STRAP, 1-1/4" x .031" OR .035"
BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD).
POSITION NEAR THE CENTER OF THE UNIT WIDTH.

VERTICAL UNITIZING STRAP, 1-1/4" x .031" OR .035" BY
A LENGTH TO SUIT STEEL STRAPPING (2 REQD). POSITION
AS SHOWN.

SECUREMENT OF PARTIAL UNIT ON TOP

VERTICAL UNITIZING STRAP,
1-1/4" x .031" OR .035"
BY A LENGTH TO SUIT STEEL
STRAPPING (2 REQD).



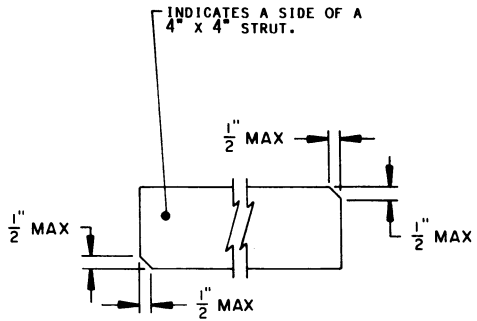
INDICATES TWO
(2) 1-1/4"
STRAP
SEALS.

FIGURE-8 UNITIZING STRAP, 1-1/4" x .031" OR .035"
BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD).
POSITION NEAR THE CENTER OF THE UNIT WIDTH. NOTE
THAT THE STRAP PASSES THRU THE FORKLIFT OPENINGS
OF THE UPPER PALLET.

SPECIAL NOTE:

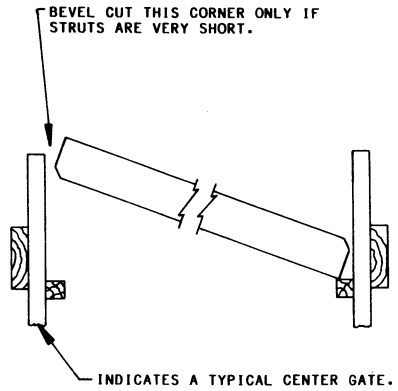
1. THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CROSSWISE LOAD. CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN TWO (2) LAYERS OF CONTAINERS. FOR SHIPMENT OF MORE THAN TWO LAYERS OF CONTAINERS. REFER TO THE PROCEDURES ON PAGE 63.

SECUREMENT OF PARTIAL UNIT ON TOP



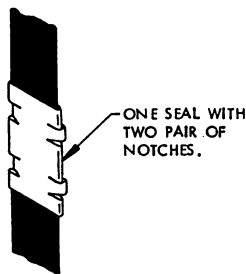
BEVEL-CUT

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



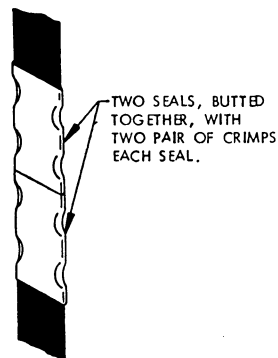
STRUT INSTALLATION

SEE GENERAL NOTE "U" ON PAGE 2 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE



STRAP JOINT A

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

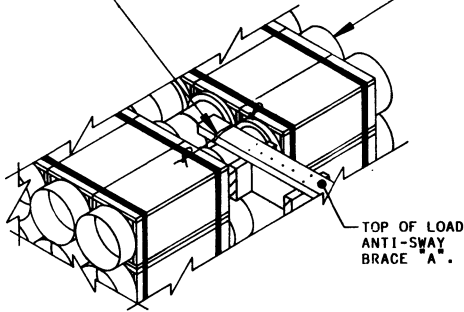


STRAP JOINT B

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

NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE AROUND A PALLET UNIT TIE DOWN STRAP AND TWIST TO SELF.

PARTIAL VIEW SHOWING TOP LAYER OF PROTECTIVE COVER METHOD PALLET UNIT WITH CONTAINERS POSITIONED LENGTHWISE.

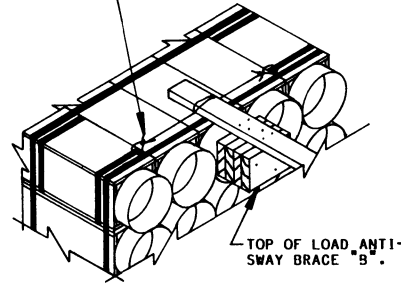


TIE WIRE APPLICATION A

FOR PROTECTIVE COVER METHOD UNITS. CONTAINERS POSITIONED LENGTHWISE.

NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE AROUND A PALLET UNIT RETAINER STRAP AND TWIST TO SELF.

PARTIAL VIEW SHOWING TOP LAYER OF PROTECTIVE COVER METHOD PALLET UNIT WITH CONTAINERS POSITIONED CROSSWISE.

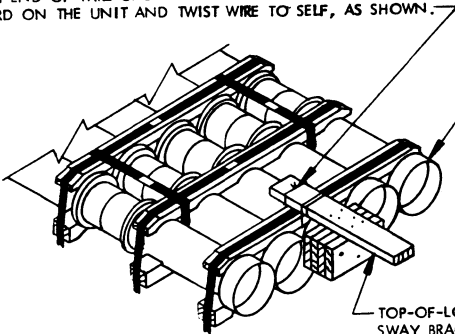


TIE WIRE APPLICATION B

FOR PROTECTIVE COVER METHOD UNITS. CONTAINERS POSITIONED CROSSWISE.

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

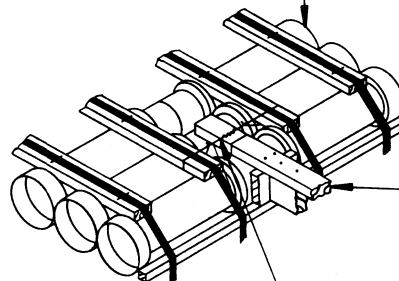
PARTIAL VIEW SHOWING TOP LAYER OF ROUTED DUNNAGE METHOD PALLET UNIT WITH CONTAINERS POSITIONED CROSSWISE.



TIE WIRE APPLICATION C

FOR ROUTED DUNNAGE METHOD OR FLAT DUNNAGE METHOD UNITS. CONTAINERS POSITIONED CROSSWISE.

PARTIAL VIEW SHOWING TOP LAYER OF FLAT DUNNAGE METHOD PALLET UNIT WITH CONTAINERS POSITIONED LENGTHWISE.

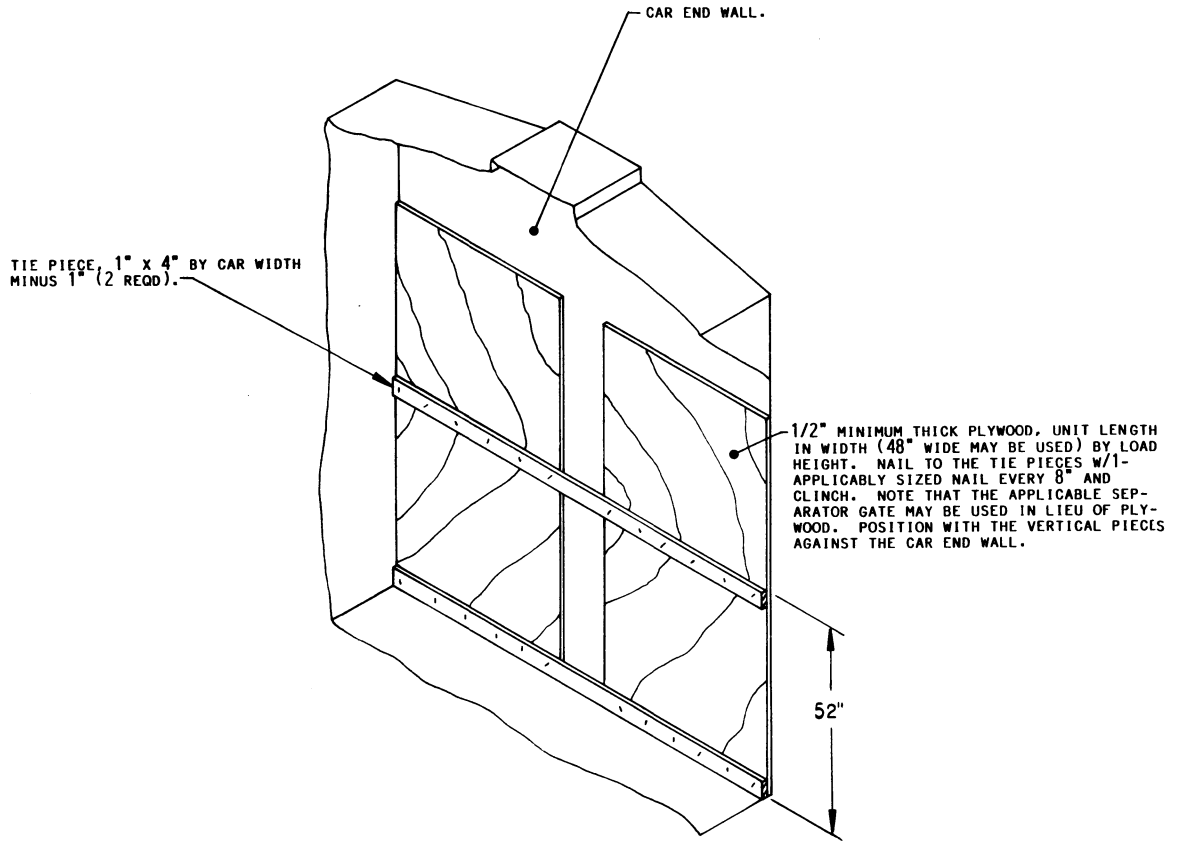


TOP-OF-LOAD ANTI-SWAY BRACE "A".

TIE WIRE APPLICATION D

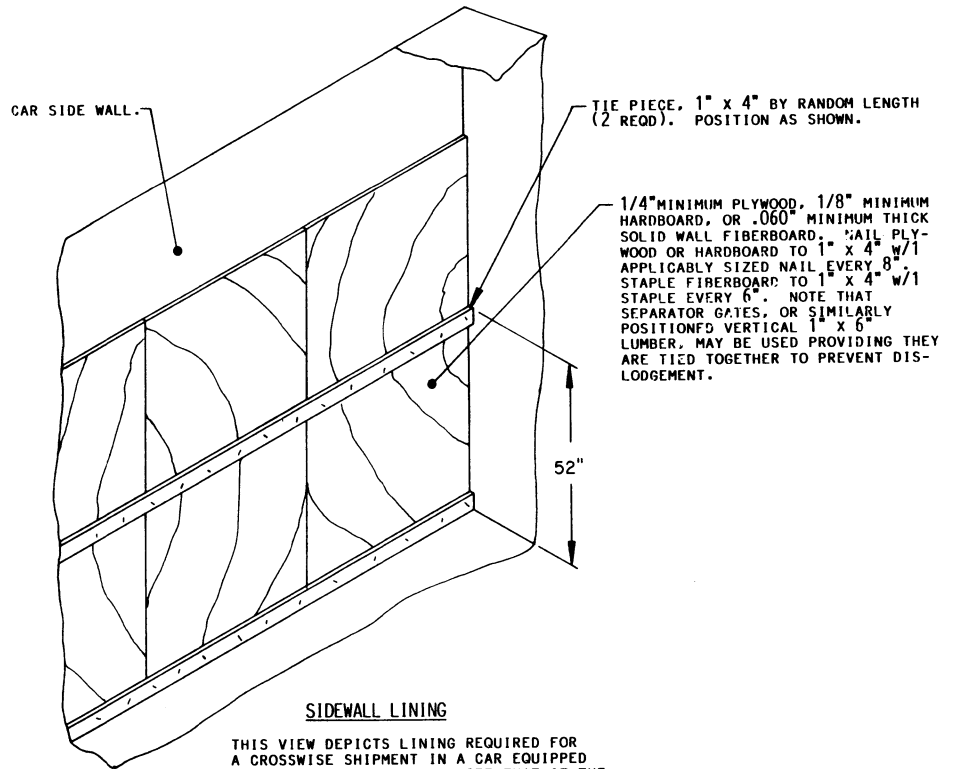
FOR ROUTED DUNNAGE METHOD OR FLAT DUNNAGE METHOD UNITS. CONTAINERS POSITIONED LENGTHWISE.

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



END WALL LINING

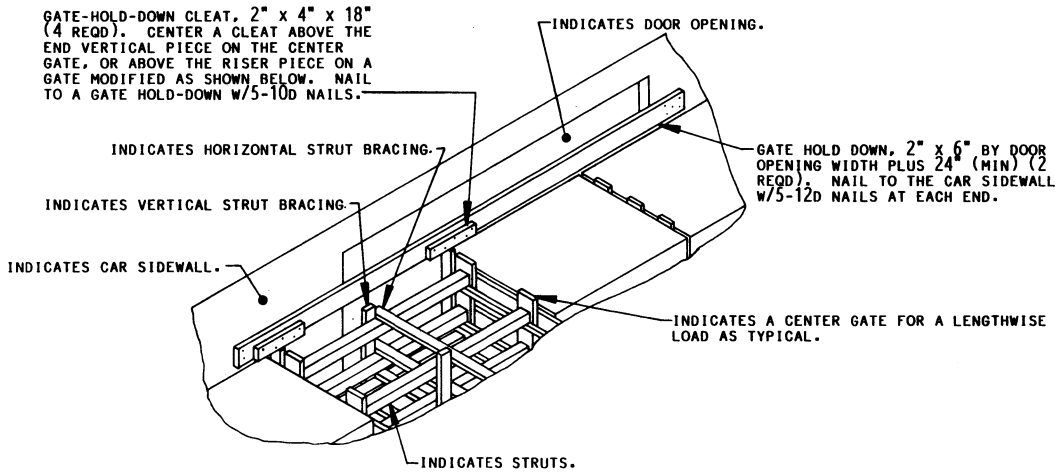
THIS VIEW DEPICTS LINING REQUIRED FOR A LENGTHWISE LOAD IN A CAR EQUIPPED WITH A STEEL END WALL.



SIDEWALL LINING

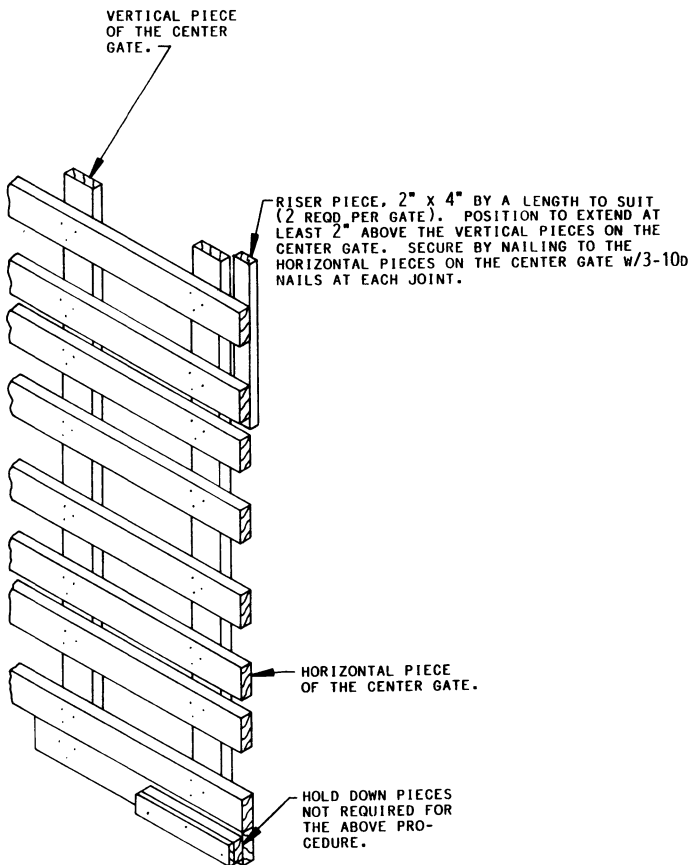
THIS VIEW DEPICTS LINING REQUIRED FOR A CROSSWISE SHIPMENT IN A CAR EQUIPPED WITH A STEEL SIDEWALL. NOTE THAT IF THE CAR IS EQUIPPED WITH A STEEL-FACED PLUG DOOR, THE SPECIAL LINING WILL ALSO BE REQUIRED IN THE DOORWAY AREA IF THE SPECIFIED DOORWAY PROTECTION DOES NOT SUFFICE.

DETAILS



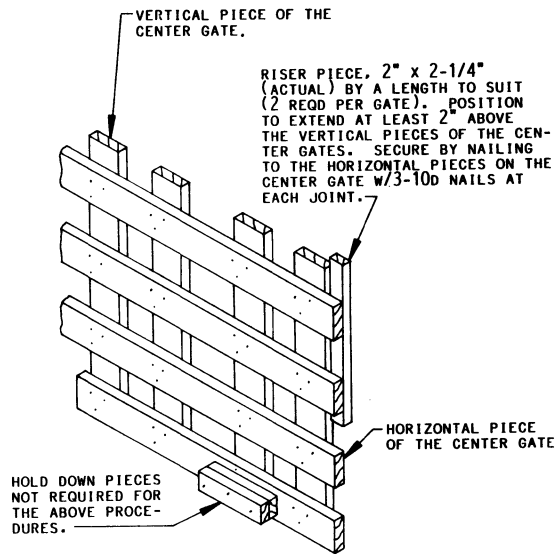
ALTERNATIVE GATE HOLD DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD DOWN WHICH CAN BE USED IF DESIRED, FOR THE LOADS SHOWN ON PAGES 6 THRU 14 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.



MODIFIED CENTER GATE "A"

ALSO APPLICABLE FOR CENTER GATES "B" AND "C".



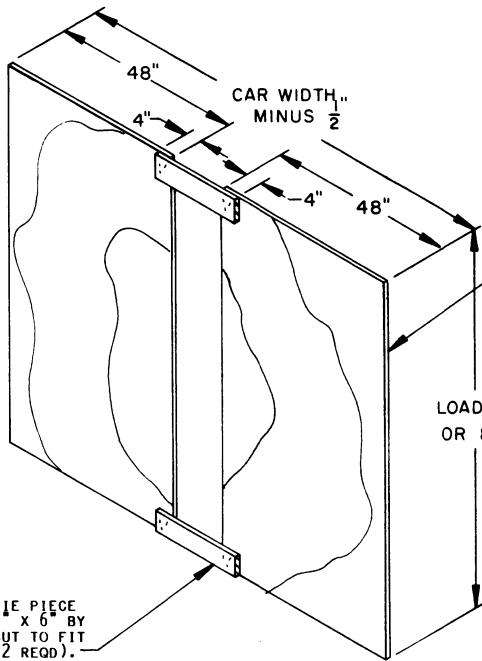
MODIFIED CENTER GATE "D"

ALSO APPLICABLE FOR CENTER GATES "E" AND "F".

CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THESE VIEWS ARE APPLICABLE FOR CENTER GATES "A" AND "D" WHICH HAVE 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 AS SHOWN IN THE "ALTERNATIVE GATE HOLD-DOWN" DETAIL AT THE TOP OF THIS PAGE. THESE PROCEDURES MAY BE USED WITH A 1-HIGH OR 2-HIGH LOAD AS INDICATED BY MODIFIED CENTER GATES.

DETAILS



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 NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE ALTERNATIVE SEPARATOR GATES ADJACENT TO THE NAILED BLOCKING MUST BE MODIFIED. 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 CUTOUT 3-1/2" HIGH BY 8" WIDE. THE USE OF THIS MODIFIED GATE WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.

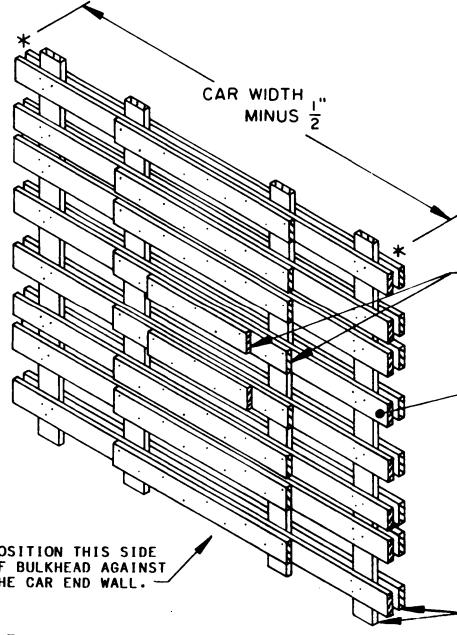
PLYWOOD, 3/8" X 48" WIDE BY A HEIGHT TO SUIT (2 REQD). NAIL TO EACH TIE PIECE W/3-4D NAILS AT EACH JOINT AND CLINCH.

LOADING HEIGHT OR 8'-0" MAX

TIE PIECE 1" X 6" BY CUT TO FIT (2 REQD).

ALTERNATIVE SEPARATOR GATE

SEE "NOTE ▲" AT RIGHT



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

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.

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

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

END OF CAR BULKHEAD

SEE "NOTE ○" AT RIGHT.

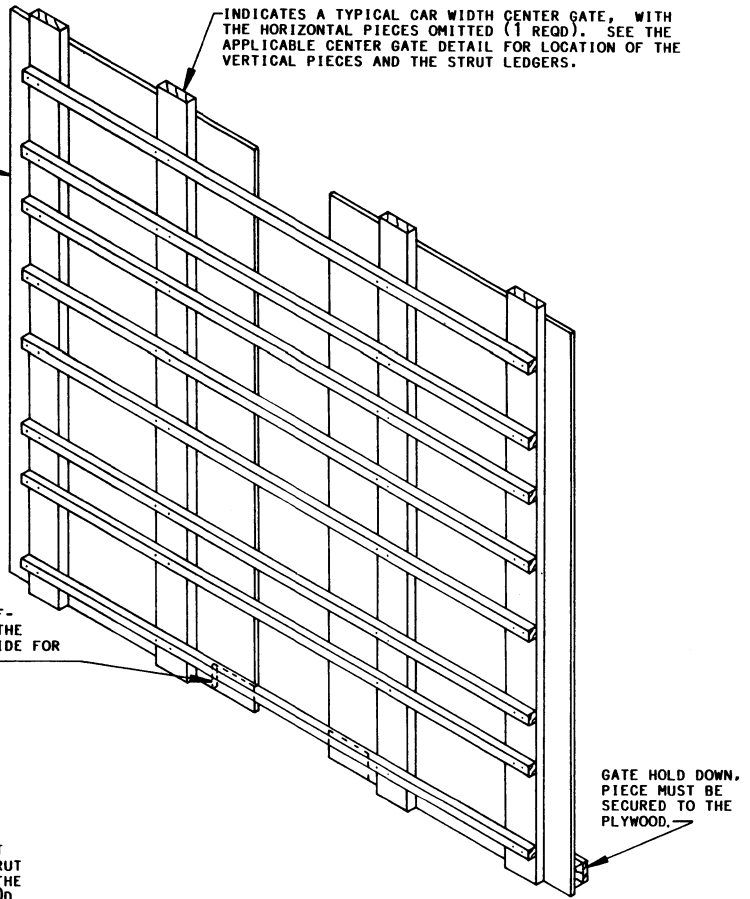
NOTE ○ :

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 FOR THE UNIT POSITION (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "A" AS DETAILED ON PAGE 26 IS SHOWN AS TYPICAL.

PLYWOOD, 1/2" THICK BY THE UNIT LENGTH OR WIDTH BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-0D NAIL EVERY 6". NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT WIDTH IF THE LENGTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD SHOWN ON PAGE 8, OR UNIT LENGTH IF THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 6. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.

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

WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, EACH PLYWOOD SHEET MUST HAVE A CUTOUT AT THE LOWER INSIDE CORNER TO PROVIDE CLEARANCE FOR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD. THE CUTOUT MUST BE 3-1/2" HIGH AND OF SUFFICIENT WIDTH SO THAT THE REMAINING PLYWOOD AT THE FLOOR IS 40" WIDE FOR LENGTHWISE UNITS OR 48" WIDE FOR CROSSWISE UNITS.

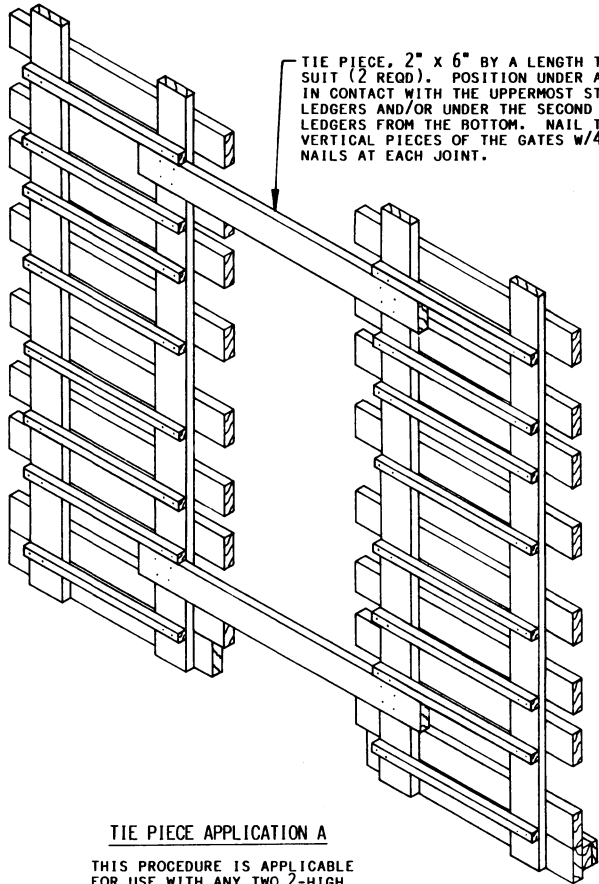


GATE HOLD DOWN, PIECE MUST BE SECURED TO THE PLYWOOD.

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

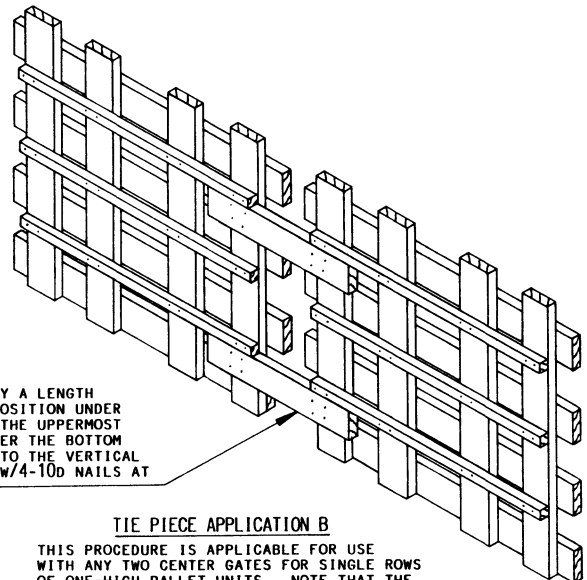
PLYWOOD CENTER GATE ALTERNATIVE

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



TIE PIECE APPLICATION A

THIS PROCEDURE IS APPLICABLE FOR USE WITH ANY TWO 2-HIGH CENTER GATES FOR SINGLE ROWS OF PALLET UNITS. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

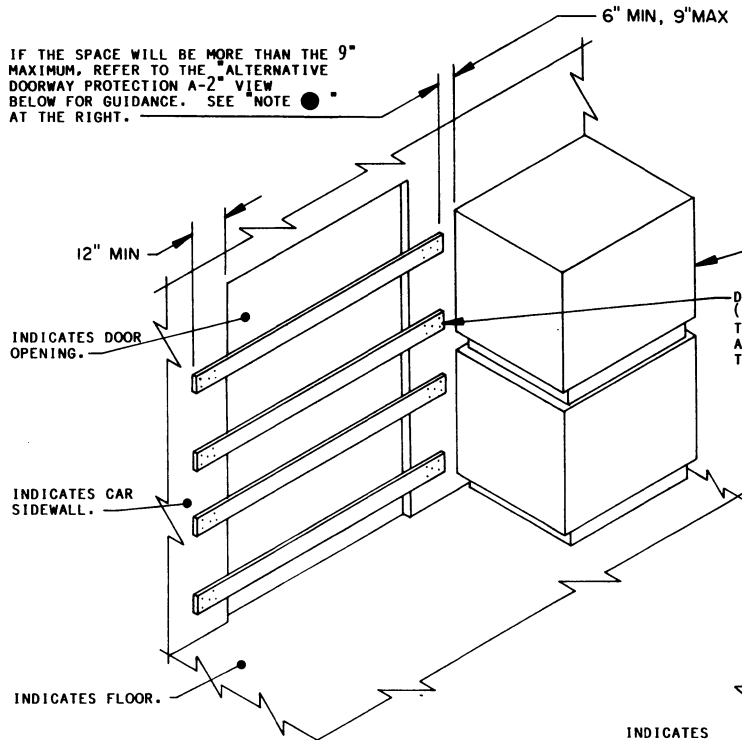


TIE PIECE APPLICATION B

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

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

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



NOTE:

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

INDICATES A TYPICAL PALLET UNIT.

DOOR SPANNER, 1" x 6" BY DOOR OPENING WIDTH PLUS 24" (MIN) (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. NAIL TO THE CAR SIDEWALL W/5-6D NAILS AT EACH END. SEE "NOTE" ABOVE.

FILLER PIECE, 1" x 6" BY A LENGTH TO PROVIDE A SPACE OF BETWEEN 6" AND 9" (2 OR 4 REQD PER LAYER). NAIL TO THE CAR SIDEWALL W/1-6D NAIL EVERY 8" (MINIMUM OF 2 NAILS). SEE "NOTE" ABOVE.

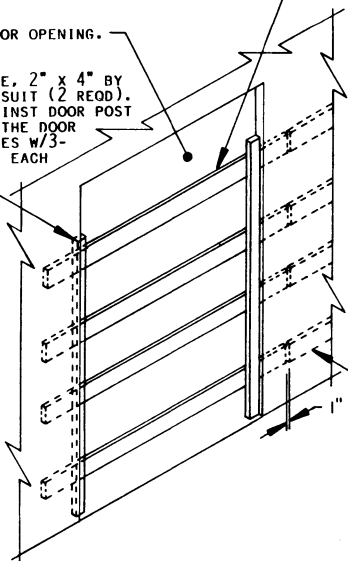
ALTERNATIVE DOORWAY PROTECTION A-1

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 ALTERNATIVE DOORWAY PROTECTION C PROCEDURES ON PAGE 74 WHEN THE CONTAINERS ARE POSITIONED CROSSWISE, OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED IN THE LOADS ON PAGES 20 AND 24, OR THE ALTERNATIVE DOORWAY PROTECTION "E" AND "F" DETAILS ON PAGE 75.

DOOR SPANNER, 2" (MIN) x 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. SEE "NOTE" ABOVE.

INDICATES DOOR OPENING.

SUPPORT PIECE, 2" x 4" BY A LENGTH TO SUIT (2 REQD). POSITION AGAINST DOOR POST AND NAIL TO THE DOOR SPANNER PIECES W/3-10D NAILS AT EACH JOINT.



INDICATES DOOR OPENING.

12" MIN

SEE "NOTE" ABOVE.

6" MIN, 9" MAX

INDICATES CAR SIDEWALL.

INDICATES A TYPICAL PALLET UNIT.

DOOR SPANNER, 1" x 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. NAIL TO THE CAR SIDEWALL W/5-6D NAILS AT EACH END. SEE "NOTE" ABOVE.

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. THE VIEW ABOVE IS FOR A ONE LAYER LOAD.

INDICATES FILL MATERIAL NAILED TO THE SIDEWALL, OR A FILLER PIECE, 2" x 6" BY A LENGTH TO EQUAL THE LENGTH OF THE FILLER PIECE ON THE OPPOSITE SIDEWALL MINUS 1" (QUANTITY TO BE THE SAME AS FOR THE DOOR SPANNERS AND/OR FILLER PIECES ON THE OPPOSITE SIDEWALL). SEE "NOTE" ABOVE.

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.

HORIZONTAL PIECE, 1" x 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). NAIL TO THE VERTICAL PIECES W/3-6D NAILS AT EACH END. SEE THE APPLICABLE DOORWAY PROTECTION DETAIL FOR HEIGHT LOCATION.

VIEW B

INDICATES DOOR OPENING.

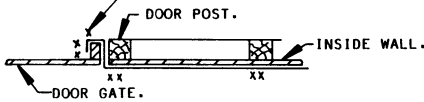
DOORWAY PROTECTION-GATE STRAP, 1-1/4" x .035" x 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

INDICATES CAR SIDEWALL.

INDICATES FLOOR.

VERTICAL PIECE, 2" x 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES LOCATION OF 7 (MIN) 4D NAILS PER STRAP.



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.

SEAL FOR 1-1/4" STRAP (2 REQD PER STRAP), DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS.

INDICATES DOOR OPENING.
INDICATES CAR SIDEWALL.

DOORWAY PROTECTION STRAP, 1-1/4" x .035" OR .031" STEEL STRAPPING BY DOOR OPENING WIDTH PLUS 8'-0" IN LENGTH (2 REQD PER LAYER). INSTALL FROM TWO (2) PIECES. THREAD ONE END THRU A STRAP ANCHOR PLATE AS SHOWN BY THE "APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE" DETAILS BELOW. NAIL STRAP ANCHOR PLATE TO CAR SIDEWALL W/4-SIGNODE NUMBER 27 RINGLOCK NAILS.

VIEW A

INDICATES STRAP ANCHOR PLATE.

DOOR SPANNER END OF STRAP.

INDICATES STRAP ANCHOR PLATE (2 REQD PER STRAP).

ISOMETRIC VIEW

VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

UNIT HEIGHT MINUS 4"

INDICATES FLOOR.

A TOLERANCE OF PLUS OR MINUS 2" IS PERMISSIBLE.

ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH THOSE LOADS IN WHICH THE PALLET UNITS ARE POSITIONED CROSSWISE OR FOR THE PROTECTIVE COVER METHOD POSITIONED LENGTHWISE. DO NOT USE FOR LENGTHWISE, FLAT, OR ROUTED DUNNAGE UNITS. THE METHOD MAY BE USED IN CARS EQUIPPED WITH EITHER PLUG TYPE DOORS OR CONVENTIONAL SLIDING DOORS, BUT ONLY IF THE CAR IS EQUIPPED WITH NAILABLE SIDEWALLS. IF THE CAR IS EQUIPPED WITH SPECIAL ANCHOR RODS IN THE CAR DOOR POSTS, THE DOORWAY PROTECTION STRAPS MAY BE SECURED TO THESE RODS IN LIEU OF ATTACHING TO THE CAR SIDEWALL WITH STRAP ANCHOR PLATES. CAUTION: A 2" x 2" VERTICAL PIECE MUST BE ADDED TO EACH END OF A CENTER GATE FOR LENGTHWISE LOADS WHICH IS WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING, TO PREVENT THE GATE FROM SHIFTING Laterally, UNLESS PLYWOOD IS BEING USED IN LIEU OF THE 2" x 6" HORIZONTAL PIECES IN WHICH CASE THE ADDED VERTICAL PIECES WILL NOT BE REQUIRED. THE VIEW SHOWN IS FOR A ONE-LAYER LOAD.

DOORWAY PROTECTION

DOOR SPANNER, 2" x 6" BY DOOR OPENING WIDTH PLUS 24" (1 REQD). POSITION ABOVE THE LOAD AND NAIL THRU A FILLER BLOCK INTO A VERTICAL PIECE W/3-12D NAILS AT EACH JOINT. NAIL TO THE CAR SIDEWALL W/3-12D NAILS AT EACH END (OPTIONAL).

FILLER BLOCK, 1" x 4" x 9" (2 REQD). NAIL TO A VERTICAL PIECE W/4-6D NAILS.

DOOR OPENING WIDTH

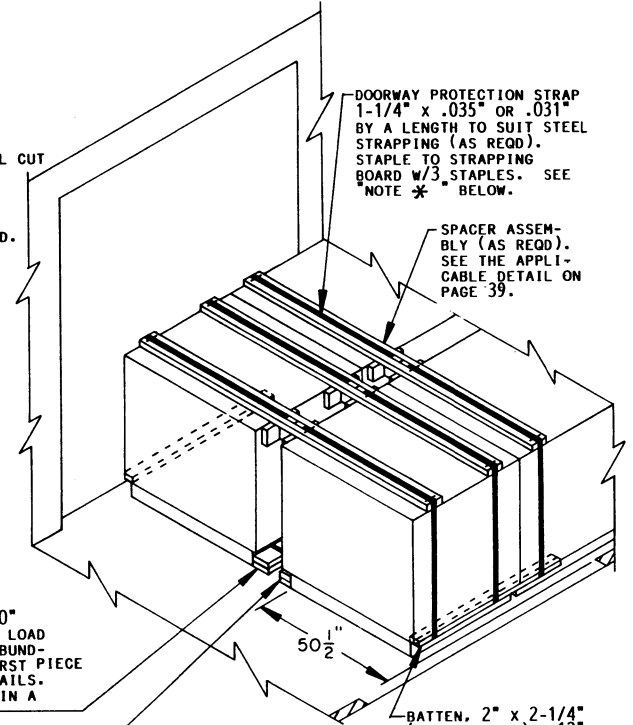
VERTICAL PIECE, 2" x 3" BY A LENGTH TO SUIT (2 REQD).

HORIZONTAL PIECE, 1" x 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). LOCATE AT HEIGHTS AS SPECIFIED BY THE DOORWAY PROTECTION DETAIL. NAIL TO THE VERTICAL PIECES W/3-6D NAILS AT EACH END.

SPREADER PIECE, 2" x 3" MATERIAL CUT SLIGHTLY LONGER THAN MEASURED DISTANCE (2 REQD). DRIVE INTO POSITION TO PROVIDE FOR A WEDGE FIT. TOENAIL TO THE VERTICAL PIECES W/2-12D NAILS AT EACH END.

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 AVAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 74 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 70.



DOORWAY PROTECTION STRAP 1-1/4" x .035" OR .031" BY A LENGTH TO SUIT STEEL STRAPPING (AS REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE "NOTE *" BELOW.

SPACER ASSEMBLY (AS REQD). SEE THE APPLICABLE DETAIL ON PAGE 39.

DOORWAY PROTECTION STRAP, 1-1/4" x .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (AS REQD). STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE "NOTE *" BELOW.

SPACER ASSEMBLY (AS REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 39.

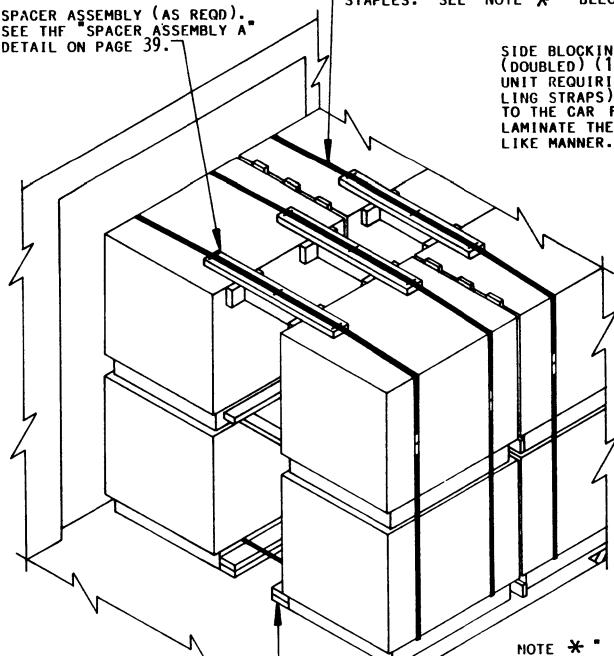
SIDE BLOCKING, 2" x 6" x 40" (DOUBLED) (1 REQD FOR EACH LOAD UNIT REQUIRING ONE OR TWO BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.

50 1/2"

BATTEN, 2" x 2-1/4" (ACTUAL SIZE) x 12" OR LENGTH TO SUIT (AS REQD). POSITION UNDER CONTAINER BELLS PRIOR TO TENSIONING STRAP.

SIDE BLOCKING, 2" x 4" x 40" (DOUBLED) (1 REQD FOR EACH LOAD UNIT REQUIRING ONE OR TWO BUNDLING STRAPS). PRE-POSITION. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.

ALTERNATIVE DOORWAY PROTECTION E

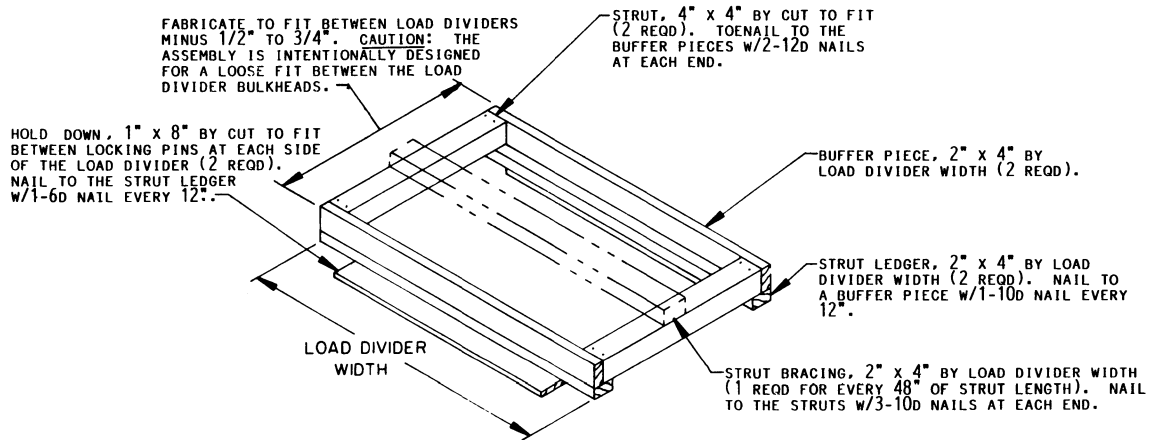
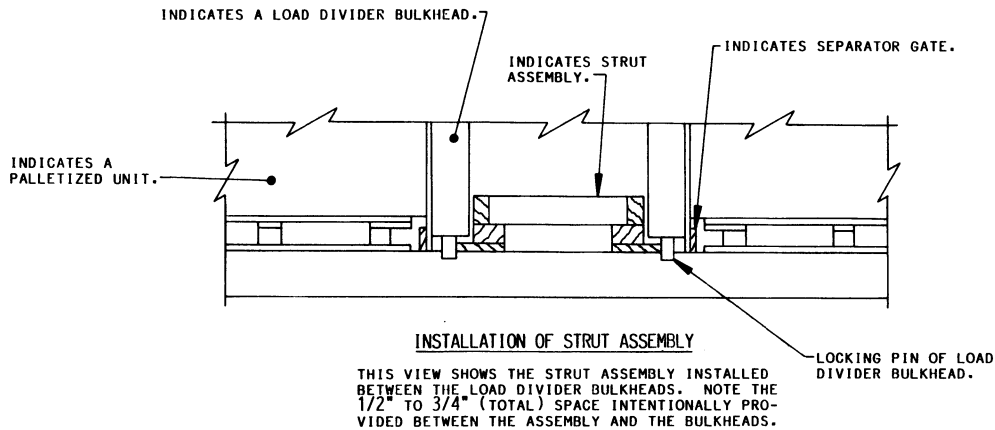


SIDE BLOCKING, 2" x 6" x 48" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING 1 OR 2 BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16D NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER. OMIT ANTI-SWAY BRACE(S) AT FLOOR LEVEL.

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

ALTERNATIVE DOORWAY PROTECTION F

DETAILS

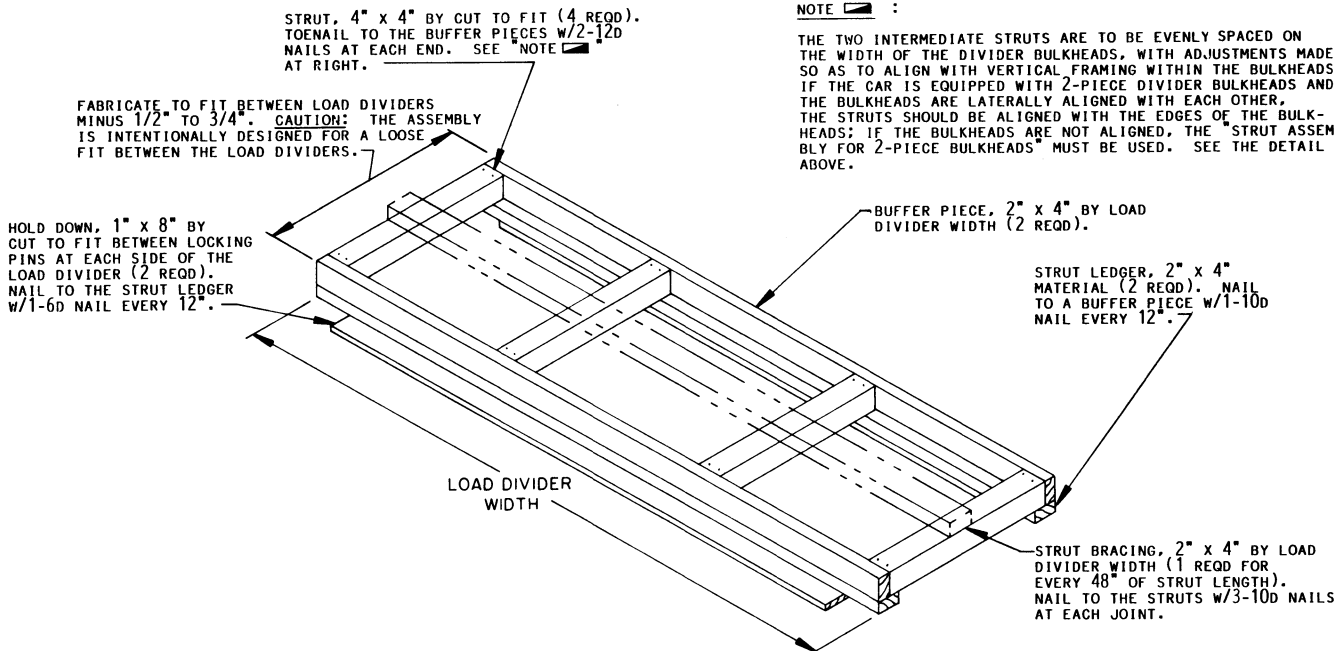


STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

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

NOTE :

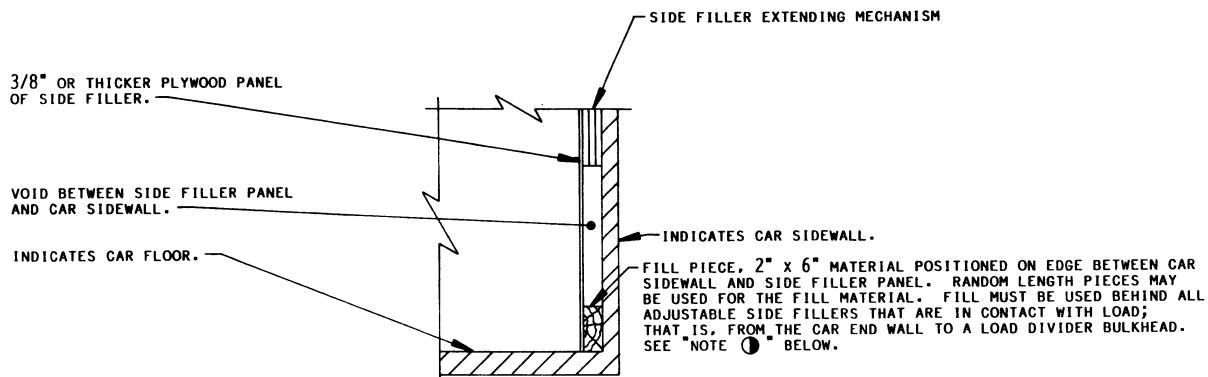
THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS. IF THE CAR IS EQUIPPED WITH 2-PIECE DIVIDER BULKHEADS AND THE BULKHEADS ARE LATERALLY ALIGNED WITH EACH OTHER, THE STRUTS SHOULD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



STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

PROVISIONS FOR BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS

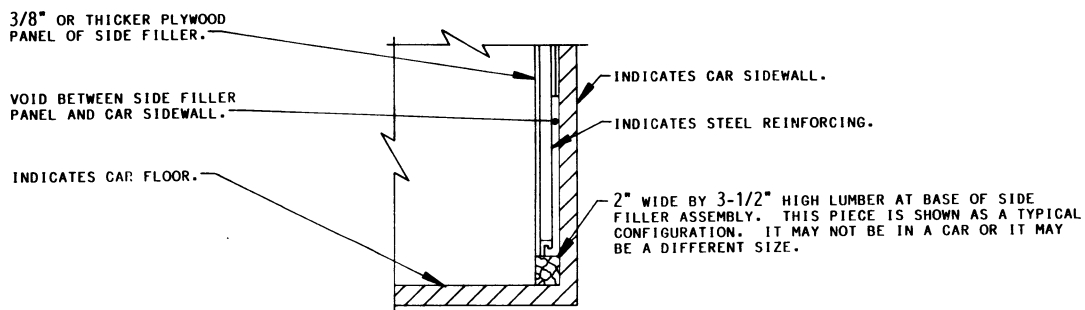


TYPICAL TYPE A

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

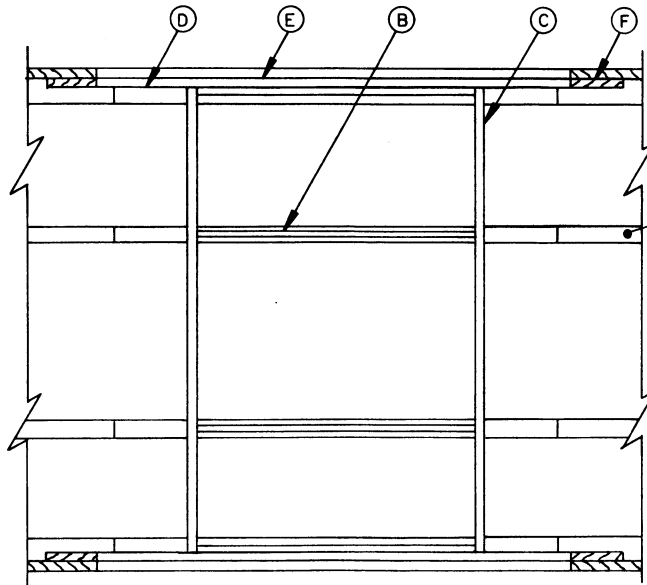
NOTE 1 :

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

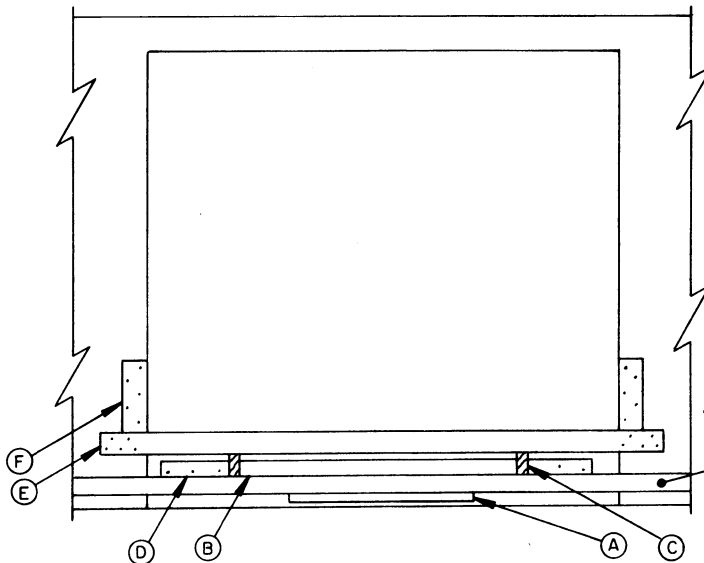
THIS VIEW SHOWS A TYPICAL SECTION OF A CAR EQUIPPED WITH HEAVY DUTY, STEEL REINFORCED, ADJUSTABLE SIDE FILLERS. A "FILL PIECE", AS SHOWN IN THE "TYPICAL TYPE A" DETAIL ABOVE, IS NOT REQUIRED IN CARS SO EQUIPPED.



INDICATES A 4" x 4" STRUT OF THE STRUT ASSEMBLY.

PLAN VIEW OF STRUT ASSEMBLY HOLD DOWN

THIS PLAN VIEW AND THE SIDE ELEVATION VIEW BELOW DEPICT THE HOLD-DOWN BLOCKING WHICH IS REQUIRED WHEN THE STRUTS OF THE "STRUT ASSEMBLY" USED IN A LOAD DIVIDER CAR ARE LONGER THAN 12'-0". NOTE THAT THE SPECIAL STRUT HOLD-DOWN AND THE STRUT ASSEMBLY ARE ONLY REQUIRED IF THE LOAD BEHIND EITHER DOOR IS MORE THAN 50,000 POUNDS, AND ONLY FOR LOADS OF CLASS A OR CLASS B EXPLOSIVES.



INDICATES A 4" x 4" STRUT OF THE STRUT ASSEMBLY.

SIDE ELEVATION VIEW OF STRUT ASSEMBLY HOLD DOWN

KEY LETTERS

- (A) FILLER PIECE, 2" x 4" x 48" (4 REQD). POSITION SO AS TO BE CENTERED IN THE DOORWAY AREA AND NAIL TO THE BOTTOM SURFACE OF A STRUT W/4-10D NAILS.
- (B) SPACER PIECE, 2" x 4" x 72" (4 REQD). POSITION ON EDGE SO AS TO BE CENTERED IN THE DOORWAY AREA AND TOENAIL TO A STRUT W/3-12D NAILS ON EACH SIDE.
- (C) HOLD-DOWN, 2" x 6" BY CAR WIDTH (CUT TO FIT IF THE CAR HAS PLUG DOORS, OR 2" x 6" BY CAR WIDTH PLUS 4" IF THE CAR HAS CONVENTIONAL SLIDING DOORS) (2 REQD). NAIL TO EACH PIECE MARKED (B) W/2-12D NAILS AND TOENAIL TO THE STRUTS W/2-12D NAILS AT EACH JOINT.
- (D) BRACE PIECE, 4" x 4" x 18" (8 REQD). POSITION AGAINST A PIECE MARKED (C) AND TOENAIL TO A STRUT W/3-12D NAILS ON EACH SIDE.
- (E) DOOR SPANNER PIECE, 2" x 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD). NAIL TO A CAR DOOR POST/SIDE WALL OR TO A NAILING STRIP W/5-12D NAILS AT EACH END. NOTE: PRIOR TO NAILING THESE PIECES IN PLACE, THE STRUTS OF THE STRUT ASSEMBLY ARE TO BE PRESSED DOWNWARD UNTIL THE PIECES MARKED (A) ARE TOUCHING OR ARE ALMOST TOUCHING THE FLOOR OF THE CAR.
- (F) HOLD-DOWN CLEAT, 2" x 6" x 18" (8 REQD). NAIL TO A CAR DOOR POST/SIDE WALL OR TO A NAILING STRIP W/5-12D NAILS.

STRUT ASSEMBLY HOLD DOWN