

APPROVED BY
BUREAU OF EXPLOSIVES

J. Ashman

DATE 11/5/92

LOADING AND BRACING (CL & LCL) IN BOX CARS OF COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS AND UNITIZED ON A 44-1/2" X 42" METAL PALLET

PA117 SERIES CONTAINER

SEE PAGE 5 FOR INDEX.

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

U.S. ARMY MATERIEL COMMAND DRAWING

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APRIL 1993

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DO NOT SCALE

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE UNLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR COMPLETE ROUNDS PACKED IN THE PA117 CONTAINER AND UNITIZED ON A 44-1/2" X 42" METAL PALLET. SEE THE PICTORIAL VIEW ON PAGE 5. REFER TO AMC DRAWING 19-48-4079/8-20PM1002 FOR UNITIZATION PROCEDURES FOR THE PA117 SERIES CONTAINERS.
- 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 ARE FLUSH WITH OR OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD END WALLS. IF CARS WITH WOOD END WALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE 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 42 FOR GUIDANCE.
- E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS AGAINST THE CAR END WALL. LONGITUDINALLY ADJACENT LENGTHWISE UNITS WILL BE POSITIONED WITH BASE END AGAINST BASE END OR BELL END AGAINST BELL END. CAUTION: PALLET UNITS MUST NOT BE LOADED SO THAT THE CONTAINERS ARE CROSSWISE IN THE CAR.
- 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 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 43 FOR GUIDANCE.
- H. CONVENTIONAL BOX CARS EQUIPPED WITH SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED UNLOADING PROCEDURES ARE ALSO APPLICABLE FOR CONVENTIONAL 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. UNLESS PROHIBITED WITHIN THE SPECIAL NOTES, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- K. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET 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 BOX CAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" 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.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

LUMBER	SEE TM 743-200-1 (DUNNAGE LUMBER) AND FED SPEC MM-L-751.
NAILS	FED SPEC FF-N-105; COMMON.
STRAPPING, STEEL	ASTM D3953; FLAT STRAPPING, TYPE I, HEAVY DUTY, FINISH A, B (GRADE 2), OR C.
SEAL, STRAP	ASTM D3953; CLASS H, FINISH A, B (GRADE 2), OR C, DOUBLE NOTCH TYPE, STYLE I, II, OR IV.
STAPLE, STRAP	COMMERCIAL GRADE.
PLYWOOD	COMMERCIAL ITEM DESCRIPTION A-A-55057, TYPE A, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
WIRE, CARBON STEEL	ASTM A853; ANNEALED AT FINISH, BLACK OXIDE FINISH, .0900" DIA, GRADE 1006 OR BETTER.
HARDBOARD	ANSI/AHA A135.4, CLASS I.
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.

- O. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER, WITH TWO PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 41 FOR GUIDANCE.
- P. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDEWALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.

(CONTINUED ON PAGE 3)

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

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- R. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A AVAILABLE 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" ON PAGE 2.
- S. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE 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" THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- T. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY KEY NUMBERS (B) AND (C) ON PAGE 8. 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 STRUT AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.
- U. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 45 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.
- V. WHERE 2" X 2" PIECES ARE SPECIFIED FOR STRUT LEDGERS, 2" X 4" MATERIAL MAY BE SUBSTITUTED, IF DESIRED.
- W. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

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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 LOAD WHICH IS DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSE. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE MEMBER ARE OFF-CENTER. NOTE: IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).
 2. CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT -- ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- 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" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF COMPLETE ROUNDS. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONED DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 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 51 FOR GUIDANCE. IF THE BACK OF

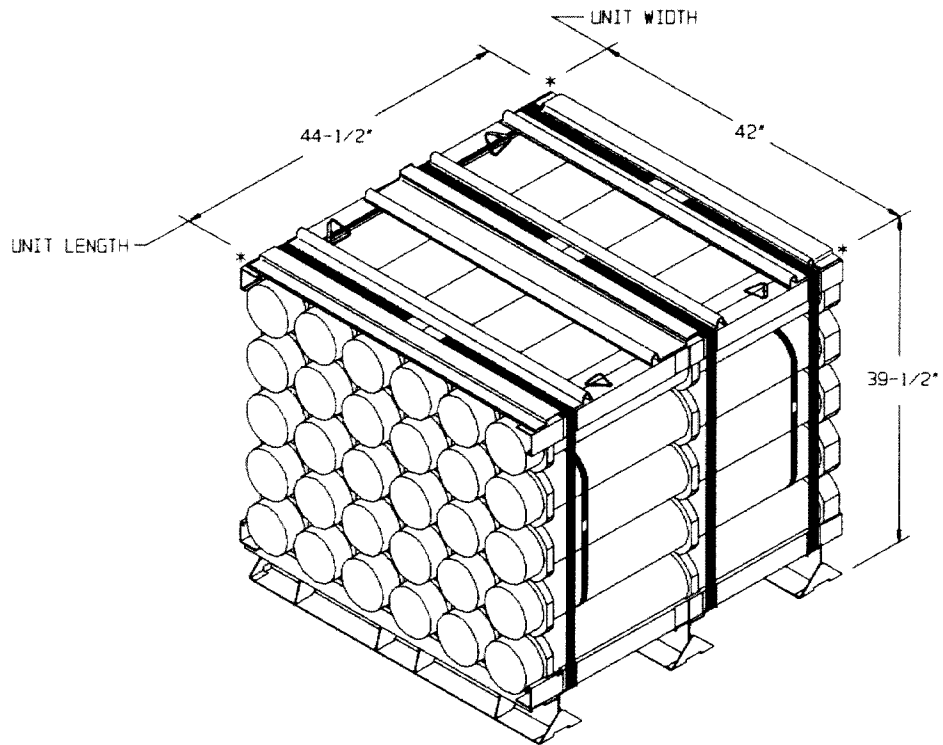
(CONTINUED ON PAGE 4)

(GENERAL NOTES CONTINUED)

THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 51, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

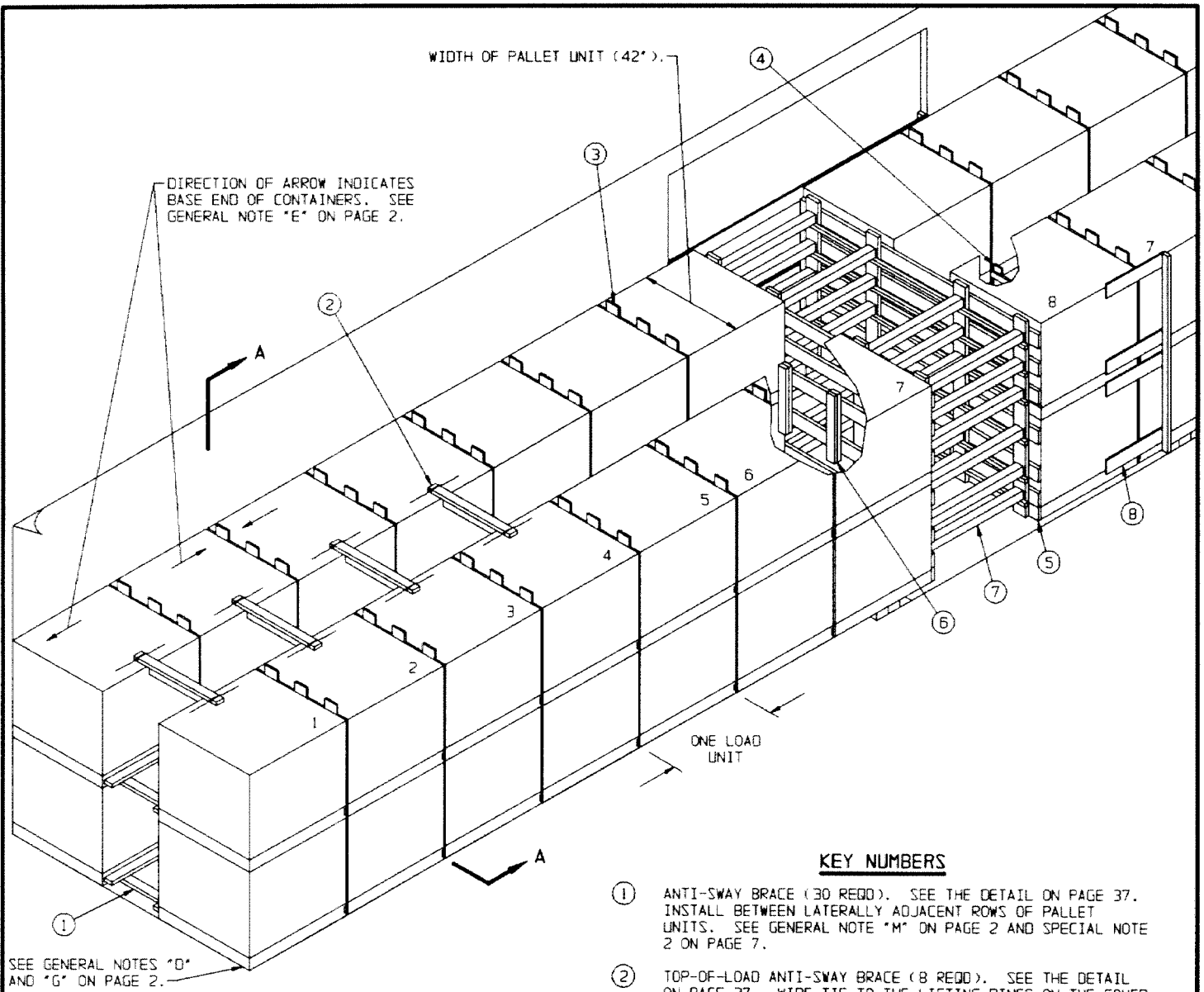
- DD. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, 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.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 50.
- 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 PALLET UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 22 AND 23.
 2. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 18 FOR GUIDANCE.
 3. AT LOCATION(S) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD IN A ONE-HIGH LOADING PATTERN. INSTALL CENTER GATES AND STRUTS AS SHOWN ON PAGE 6 OR 8 OF THE CONVENTIONAL BOX CAR DRAWING HEREIN TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 34 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 30.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.

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PALLET UNIT

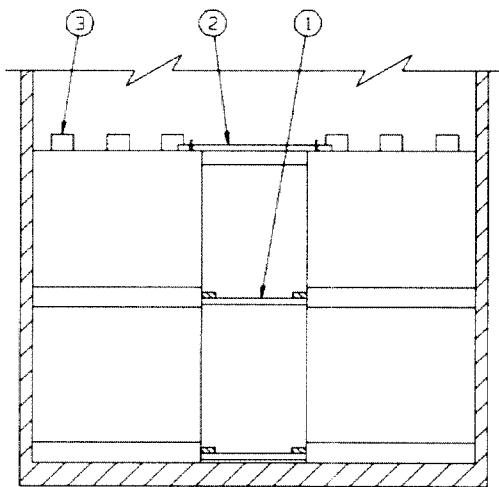
CONTAINER - - - - - 30 EACH • 57 LBS (APPROX)
UNIT WEIGHT - - - - - 1,883 LBS (APPROX)
CUBE - - - - - 42.7 CU FT (APPROX)



DIRECTION OF ARROW INDICATES
BASE END OF CONTAINERS. SEE
GENERAL NOTE "E" ON PAGE 2.

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

ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① ANTI-SWAY BRACE (30 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. SEE SPECIAL NOTE 3 ON PAGE 7.
- ③ SEPARATOR GATE (13 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4, 5 AND 7 ON PAGE 7.
- ④ SEPARATOR GATE STOP PIECE, 1" X 4" X 46" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED ③, WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 7.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 37. SEE SPECIAL NOTES 9 THRU 11 ON PAGE 7.
- ⑥ CENTER GATE STOP PIECE, 2" X 4" X 27" (DOUBLED) (4 REQD). SEE THE "CENTER GATE A" DETAIL FOR PLACEMENT AND NAILING. SEE SPECIAL NOTE 8 ON PAGE 7.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 45") (24 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "T" AND "U" ON PAGE 3.
- ⑧ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 41. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 13 ON PAGE 7.

(SPECIAL NOTES CONTINUED)

HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION" DETAIL ON PAGE 44. SEE SPECIAL NOTE 11.

11. WHEN SPLIT CENTER 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 "CENTER GATE B" DETAIL ON PAGE 40. FOR A 2-HIGH LOAD THE 36" AND 52" HIGH HORIZONTAL PIECES WILL BE EXTENDED TOWARD THE CENTER OF THE CAR WIDTH APPROXIMATELY FIVE INCHES (5"). TO PREVENT THE SPLIT GATES FROM ENTERING THE DOOR OPENING, DOUBLED 2" X 4" X 30" PIECES WILL BE POSITIONED IN CONTACT WITH THE PALLET UNITS AND NAILED TO THESE EXTENSIONS. FOR A 1-HIGH LOAD THE 21" AND 36" HIGH HORIZONTAL PIECES WILL BE EXTENDED, AND DOUBLED 28" LONG 2" X 4" PIECES APPLIED SO AS TO EXTEND SIX INCHES (6") ABOVE THE TOP HORIZONTAL PIECES.
12. DOOR SPANNER TYPE GATE HOLD-DOWN MAY BE USED IN LIEU OF DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS AVAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 46 FOR GUIDANCE.
13. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (8) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 47 THRU 49 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 LOAD BUNDLING STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION D" DETAIL ON PAGE 49 FOR GUIDANCE.
14. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. NOTE THAT STRUT BRACING WILL BE REQUIRED WHEN A LOAD UNIT IS OMITTED. SEE PIECES MARKED (8) AND (9) ON PAGE 8 FOR GUIDANCE. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 17 THRU 34 FOR GUIDANCE.
15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 36 FOR SHIPPING GUIDANCE.
16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 35 FOR GUIDANCE.
17. IF A 50'-6" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGES 8 AND 9 FOR LOADING GUIDANCE.

SPECIAL NOTES:

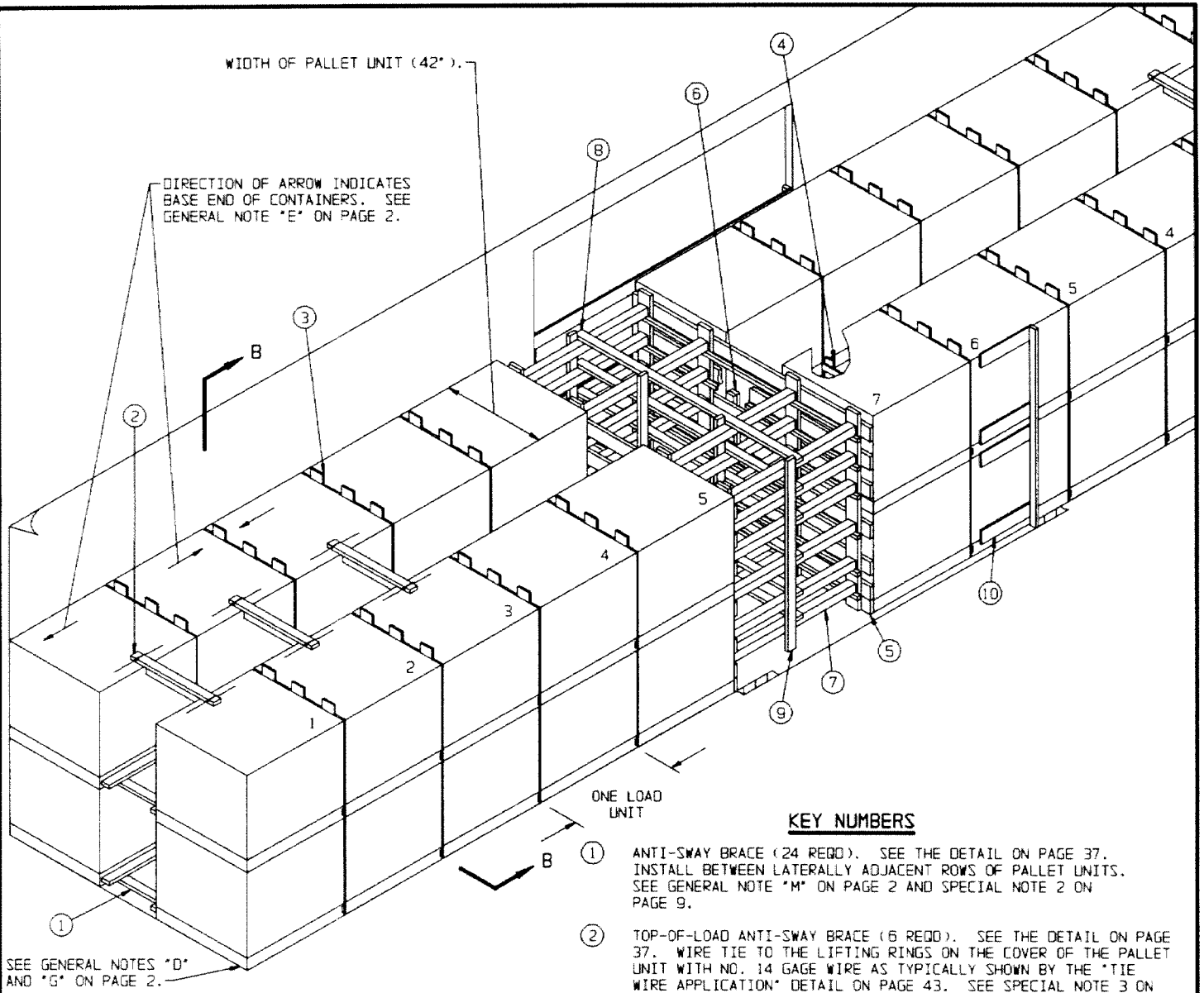
1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF THE "ALTERNATIVE DOORWAY PROTECTION D" PROCEDURES AS SHOWN ON PAGE 49 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (8), 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.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (2) IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD.
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 3" HORIZONTAL PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. 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 43 FOR CONSTRUCTION GUIDANCE.
6. SEPARATOR GATES IN THE DOORWAY AREA OF A CAR EQUIPPED WITH SLIDING DOORS MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF STOP PIECES, PIECE MARKED (4), AS SHOWN ON THE "SEPARATOR GATE A" DETAIL ON PAGE 38. 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. SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 38 FOR A GATE FOR A 2-HIGH LOAD OR THE "SEPARATOR GATE E" DETAIL ON 45 FOR A GATE FOR A 1-HIGH LOAD. THE USE OF A MODIFIED GATE WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.
8. THE CENTER GATE STOP PIECES, PIECE MARKED (6), ARE REQUIRED ON ANY CENTER GATE WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WITHIN SIX INCHES (6") OF BEING WITHIN THE DOORWAY. IF A ONE-HIGH LOAD IS BEING SHIPPED, THE CENTER GATE STOP PIECES, IF REQUIRED, WILL BE 28" LONG AND WILL BE POSITIONED SO AS TO EXTEND SIX INCHES (6") ABOVE THE 36" HIGH HORIZONTAL PIECE OF THE CENTER GATE.
9. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 44 FOR GUIDANCE.
10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATE B" AS SHOWN ON PAGE 40. AFTER THE SPLIT GATES AND STRUTS

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	238	60
1" X 4"	8	3
1" X 6"	620	310
2" X 2"	104	35
2" X 3"	27	14
2" X 4"	462	308
2" X 6"	176	176
4" X 4"	90	120
NAILS	NO. REQD	POUNDS
6d (2")	516	3
10d (3")	692	10-3/4
12d (3-1/4")	68	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE	80' REED	1-1/2 LBS

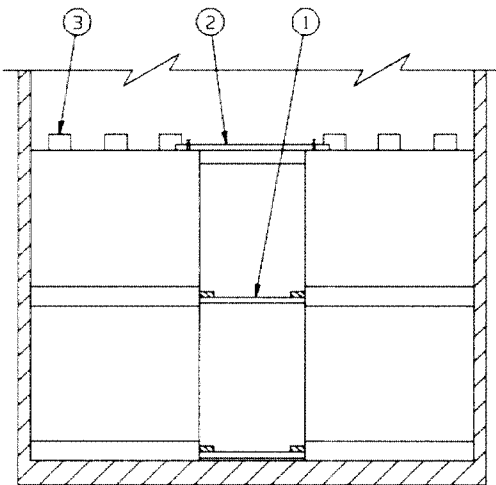
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	60	112,980 LBS
DUNNAGE		2,071 LBS
TOTAL WEIGHT		115,051 LBS (APPROX)



ISOMETRIC VIEW

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



SECTION B-B

KEY NUMBERS

- ① ANTI-SWAY BRACE (24 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE *M* ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE *TIE WIRE APPLICATION* DETAIL ON PAGE 43. SEE SPECIAL NOTE 3 ON PAGE 9.
- ③ SEPARATOR GATE (10 REQD). SEE THE *SEPARATOR GATE A* DETAIL ON PAGE 38. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4, 5 AND 7 ON PAGE 9.
- ④ SEPARATOR GATE STOP PIECE, 1" X 4" X 46" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED ③, WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 6 ON PAGE 9.
- ⑤ CENTER GATE (2 REQD). SEE THE *CENTER GATE A* DETAIL ON PAGE 37. SEE SPECIAL NOTES 9 THRU 11 ON PAGE 9.
- ⑥ CENTER GATE STOP PIECE, 2" X 4" X 27" (DOUBLED) (4 REQD). SEE THE *CENTER GATE A* DETAIL FOR PLACEMENT AND NAILING. SEE SPECIAL NOTE 8 ON PAGE 9.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 58") (24 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE *L* ON PAGE 2 AND GENERAL NOTES *T* AND *U* ON PAGE 3.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 5" IN LENGTH (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 6'-5" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑩ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 41. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 13 ON PAGE 9.

(SPECIAL NOTES CONTINUED)

SPECIAL NOTES:

11. WHEN SPLIT CENTER 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 "CENTER GATE B" DETAIL ON PAGE 40. FOR A 2-HIGH LOAD THE 36" AND 52" HIGH HORIZONTAL PIECES WILL BE EXTENDED TOWARD THE CENTER OF THE CAR WIDTH APPROXIMATELY FIVE INCHES (5"). TO PREVENT THE SPLIT GATES FROM ENTERING THE DOOR OPENING, DOUBLED 2" X 4" X 30" PIECES WILL BE POSITIONED IN CONTACT WITH THE PALLET UNITS AND NAILED TO THESE EXTENSIONS. FOR A 1-HIGH LOAD THE 21" AND 36" HIGH HORIZONTAL PIECES WILL BE EXTENDED, AND DOUBLED 28" LONG 2" X 4" PIECES APPLIED SO AS TO EXTEND SIX INCHES (6") ABOVE THE TOP HORIZONTAL PIECES.
12. DOOR SPANNER TYPE GATE HOLD-DOWN MAY BE USED IN LIEU OF DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 46 FOR GUIDANCE.
13. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 47 THRU 49 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 LOAD BUNDLING STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION D" DETAIL ON PAGE 49 FOR GUIDANCE.
14. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 17 THRU 34 FOR GUIDANCE.
15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 36 FOR SHIPPING GUIDANCE.
16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 35 FOR GUIDANCE.
17. A MAXIMUM OF FORTY (40) PALLET UNITS, FOR A LADING WEIGHT OF APPROXIMATELY 75,320 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR BY USING THE DEPICTED PROCEDURES.
18. IF A 60'-8" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGES 6 AND 7 FOR LOADING GUIDANCE.

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF THE "ALTERNATIVE DOORWAY PROTECTION D" PROCEDURES AS SHOWN ON PAGE 49 ARE 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 LENGTH ON EITHER SIDE OF THE CAR.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED ② IN THE LOAD ON PAGE 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN EITHER A 50'-6" OR A 40'-6" LONG CAR.
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 3" HORIZONTAL PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. 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 43 FOR CONSTRUCTION GUIDANCE.
6. SEPARATOR GATES IN THE DOORWAY AREA OF A CAR EQUIPPED WITH SLIDING DOORS MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF STOP PIECES, PIECE MARKED ④, AS SHOWN ON THE "SEPARATOR GATE A" DETAIL ON PAGE 38. 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. SEE THE "SEPARATOR GATE C" DETAIL ON PAGE 38 FOR A GATE FOR A 2-HIGH LOAD OR THE "SEPARATOR GATE E" DETAIL ON 45 FOR A GATE FOR A 1-HIGH LOAD. THE USE OF A MODIFIED GATE WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.
8. THE CENTER GATE STOP PIECES, PIECE MARKED ⑥, ARE REQUIRED ON ANY CENTER GATE WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WITHIN SIX INCHES (6") OF BEING WITHIN THE DOORWAY. IF A ONE-HIGH LOAD IS BEING SHIPPED, THE CENTER GATE STOP PIECES, IF REQUIRED, WILL BE 28" LONG AND WILL BE POSITIONED SO AS TO EXTEND SIX INCHES (6") ABOVE THE 36" HIGH HORIZONTAL PIECE OF THE CENTER GATE.
9. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 44 FOR GUIDANCE.
10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 8, INSTALL TWO (2) "CENTER GATE B" AS SHOWN ON PAGE 40. 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 44. SEE SPECIAL NOTE 11.

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LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	90,384 LBS
DUNNAGE		1,865 LBS
TOTAL WEIGHT		92,249 LBS (APPROX)

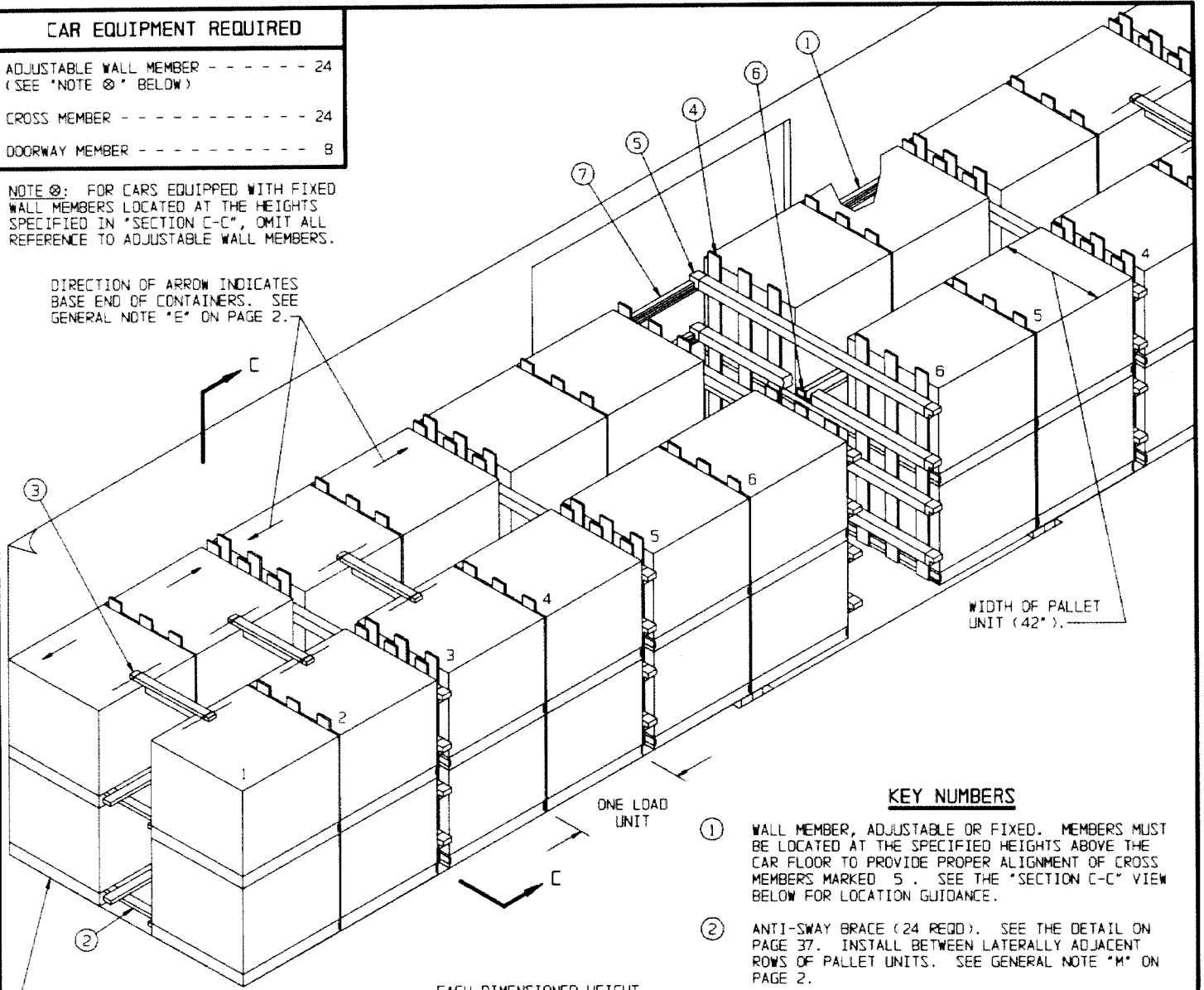
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	183	46
1" X 4"	8	3
1" X 6"	495	248
2" X 2"	104	35
2" X 3"	27	14
2" X 4"	372	248
2" X 6"	176	176
4" X 4"	116	155
NAILS	NO. REQD	POUNDS
6d (2")	408	2-1/2
10d (3")	488	7-1/2
12d (3-1/4")	58	1
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE	60' REQD	1 LB

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER - - - - -	24
(SEE "NOTE ①" BELOW)	
CROSS MEMBER - - - - -	24
DOORWAY MEMBER - - - - -	8

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

DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS. SEE GENERAL NOTE "E" ON PAGE 2.



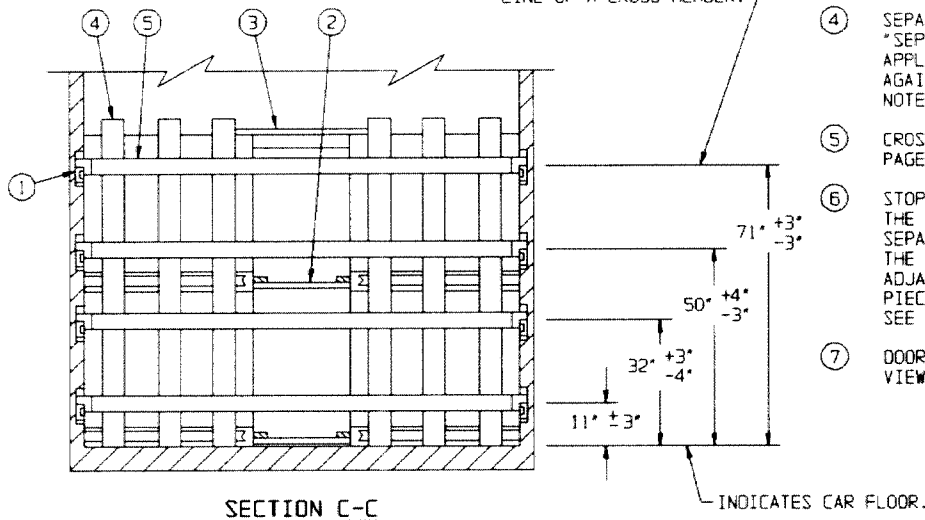
ISOMETRIC VIEW

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 5. SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (24 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. SEE SPECIAL NOTE 3 ON PAGE 11.
- ④ SEPARATOR GATE FOR 2-HIGH (16 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 6 ON PAGE 11.
- ⑤ CROSS MEMBER (24 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- ⑥ STOP PIECE, 1" X 4" X 46" (4 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATES, PIECES MARKED ④, WHICH ARE IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 11.
- ⑦ DOORWAY MEMBER (8 REQD). SEE THE "SECTION C-C" VIEW AT LEFT FOR LOCATION GUIDANCE.

SEE GENERAL NOTES "D" AND "G" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 11.

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 C-C

48-UNIT LOAD

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOXCAR EQUIPPED 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. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER 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 THROUGH-OUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, SHOWN AS PIECE MARKED (4), MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN EITHER A 40'-6" OR A 50'-6" LONG CAR; FOUR (4) ARE REQUIRED IN EACH END IF LOADING A 60'-8" LONG CAR.
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 (4), SO THE 1" X 3" HORIZONTAL PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. SEPARATOR GATES IN THE DOORWAY AREA MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF THE STOP PIECES, PIECE MARKED (6). IN CARS EQUIPPED WITH STAGGERED DOORS, STOP PIECES MAY BE REQUIRED ON UP TO FOUR SEPARATOR GATES.
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 43 FOR CONSTRUCTION GUIDANCE.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 12 AND 13 FOR GUIDANCE.
8. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 35 FOR GUIDANCE.

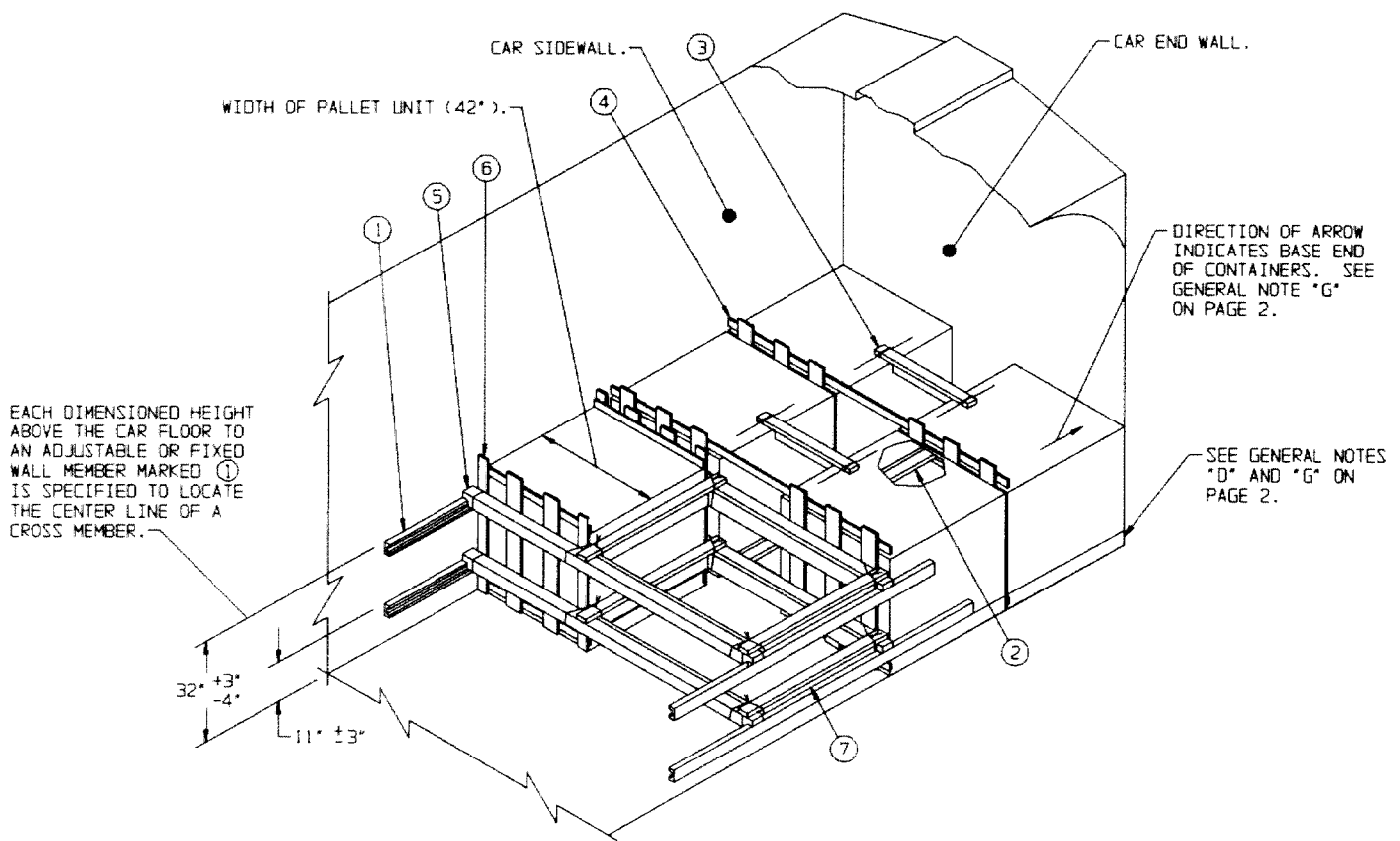
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" x 3"	287	72
1" x 4"	16	6
1" x 6"	664	332
2" x 4"	338	226
NAILS	NO. REQD	POUNDS
6d (2")	592	3-1/2
10d (3")	288	4-1/2
12d (3-1/4")	30	1/2
WIRE, NO. 14 GAGE	60' REQD	1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	90,364 LBS
DUNNAGE		1,262 LBS
TOTAL WEIGHT		91,656 LBS (APPROX)

48-UNIT LOAD

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



ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING A 40'-6" OR 50'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IF LOADING A 60'-8" LONG CAR.
4. SEPARATOR GATES MAY BE FORMED FROM 3/8" OR THICKER PLYWOOD IN LIEU OF DIMENSIONAL LUMBER, IF DESIRED. CONSTRUCT EACH GATE FOR USE IN LIEU OF PIECE MARKED ④ TO BE CAR WIDTH MINUS 1/2" IN LENGTH; FOR A GATE TO BE USED IN LIEU OF PIECE MARKED ⑥ THE PLYWOOD WILL BE 41" LONG. FOR THE HEIGHT OF THE GATES, 39" PLYWOOD WILL BE ADEQUATE.
5. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑦, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② ANTI-SWAY BRACE (2 REQ'D). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQ'D). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. SEE SPECIAL NOTE 3 AT LEFT.
- ④ SEPARATOR GATE FOR 1-HIGH BY 2-WIDE (2 REQ'D). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTE 4 AT LEFT.
- ⑤ CROSS MEMBER (4 REQ'D). SEE GENERAL NOTE "X" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH BY 1-WIDE (2 REQ'D). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 39.
- ⑦ SPACER ASSEMBLY (2 REQ'D). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 13 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

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

SUPPORT PIECE, 2" X 4" X 53"
(2 REQD). NAIL TO THE LATERAL
PIECES W/1-10d NAIL AT EACH
END AND TO A LONGITUDINAL
PIECE W/5-10d NAILS.

SPACER PIECE, 2" X 6"
X 43" (1 REQD).

CUT TO FIT

E

LATERAL PIECE, 2" X 6" BY A
LENGTH TO SUIT (2 REQD).
NAIL TO THE SPACER PIECE
W/3-10d NAILS.

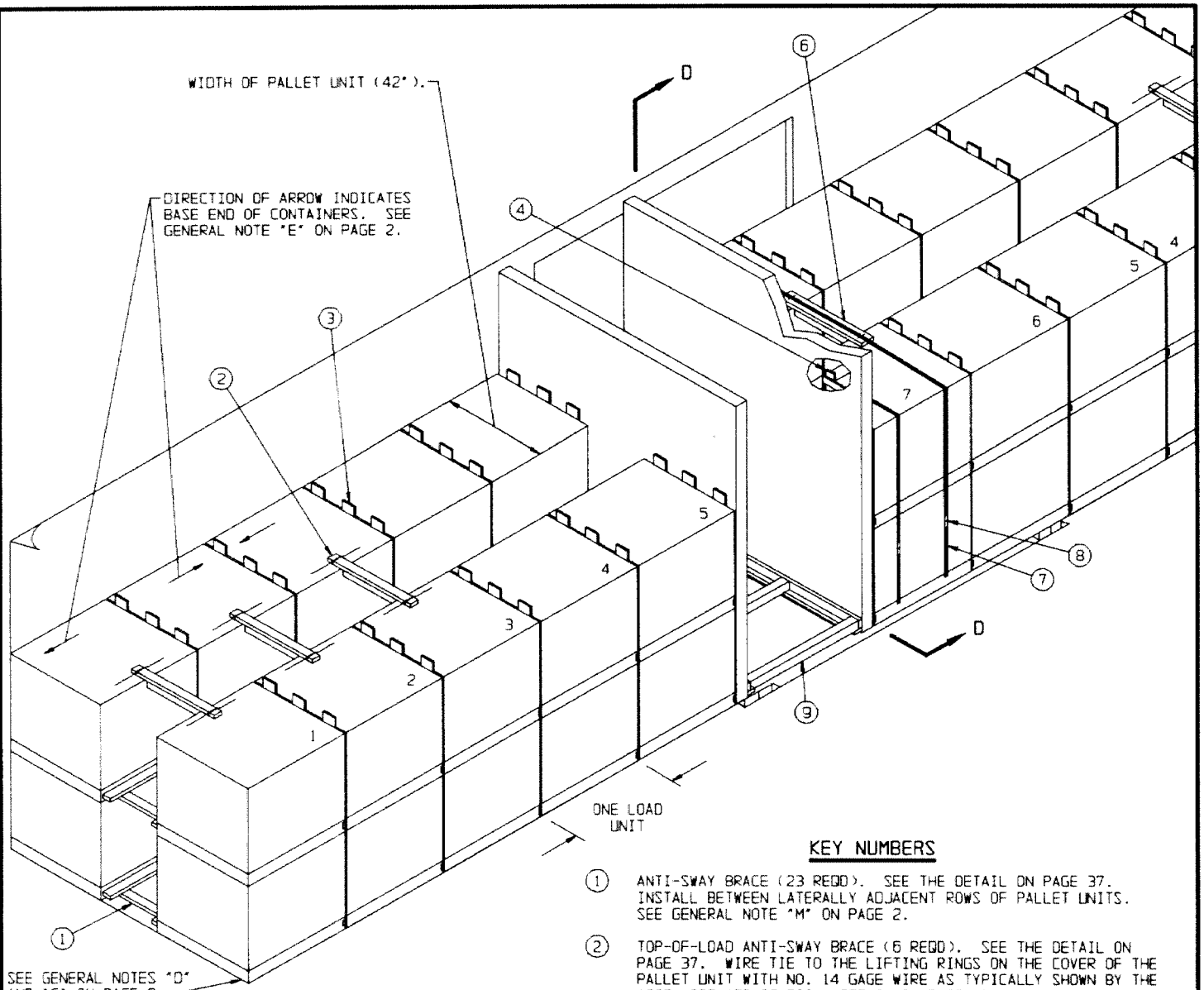
3-1/2"

46"

LONGITUDINAL PIECE, 2" X 6" X 46"
(2 REQD). NAIL TO THE LATERAL
PIECES W/3-10d NAILS AT EACH END.

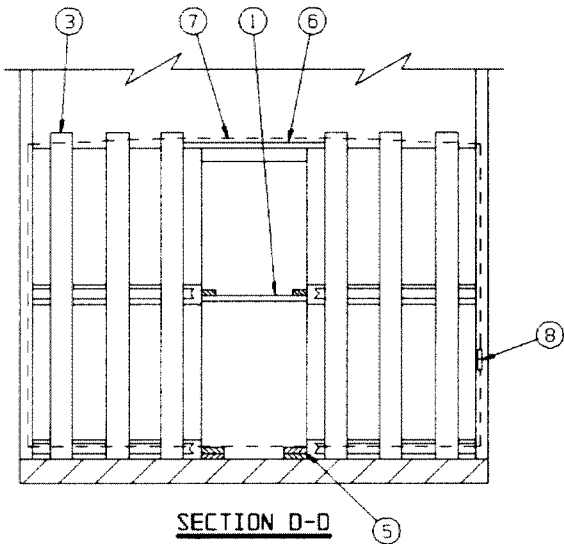
SPACER ASSEMBLY A

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



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

ISOMETRIC VIEW



SECTION D-D

KEY NUMBERS

- ① ANTI-SWAY BRACE (23 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. SEE SPECIAL NOTE 2 ON PAGE 15.
- ③ SEPARATOR GATE (12 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 3 AND 4 ON PAGE 15.
- ④ SEPARATOR GATE STOP PIECE, 1" X 4" X 46" (2 REQD). INSTALL ON THE SIDE OPPOSITE THE VERTICAL PIECES OF THE SEPARATOR GATE, PIECE MARKED ③, WHICH IS IN THE DOORWAY AREA. POSITION IN CONTACT WITH THE ADJACENT PALLET UNITS AND NAIL TO THE HORIZONTAL PIECES W/2-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 5 ON PAGE 15.
- ⑤ DOORWAY BLOCKING, 2" X 6" X 42" (DOUBLED) (2 REQD). POSITION AGAINST THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN IN THE "SECTION D-D" VIEW BELOW. NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 6 ON PAGE 15.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 39.
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 33'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS AND THE SPACER ASSEMBLY IN THE DOORWAY AREA. STAPLE TO THE SPACER ASSEMBLY W/2 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 15.
- ⑧ SEAL FOR 1-1/4" STRAPPING (4 REQD). DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF CRIMPS. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑨ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 50. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 15.

(SPECIAL NOTES CONTINUED)

- 9. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 36 FOR GUIDANCE.
- 10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 35 FOR GUIDANCE.
- 11. SIXTY (60) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 112,980 POUNDS, CAN BE LOADED IN A 60'-8" LONG CAR.

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 WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGES 3 AND 4.
- 2. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (2) IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING A 40'-6" OR 50'-6" LONG CAR; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 50'-8" LONG CAR.
- 3. 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 3" HORIZONTAL PIECES ARE LOCATED UNDER THE "OVERHANG" OF THE PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
- 4. 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 43 FOR CONSTRUCTION GUIDANCE.
- 5. 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 STOP PIECES, PIECE MARKED (4), AS SHOWN ON THE "SEPARATOR GATE A" DETAIL ON PAGE 38. 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.
- 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 DEPICTED DOORWAY PROTECTION IS APPLICABLE FOR BOXCARS EQUIPPED WITH EITHER SLIDING TYPE OR PLUG TYPE DOORS, OR A COMBINATION THEREOF. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING TYPE DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED (10) ON PAGE 8, OR ANY OF THE ALTERNATIVES ON PAGES 47 THRU 49, MAY BE USED.
- 7. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED (9) IN THE LOAD ON PAGE 14, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED PALLET UNIT, A STRUT ASSEMBLY WILL BE REQUIRED IF THE LOAD IN ONE END OF THE CAR CONSISTS OF MORE THAN SIX (6) LOAD UNITS.
- 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) 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 17 THRU 34 FOR GUIDANCE.

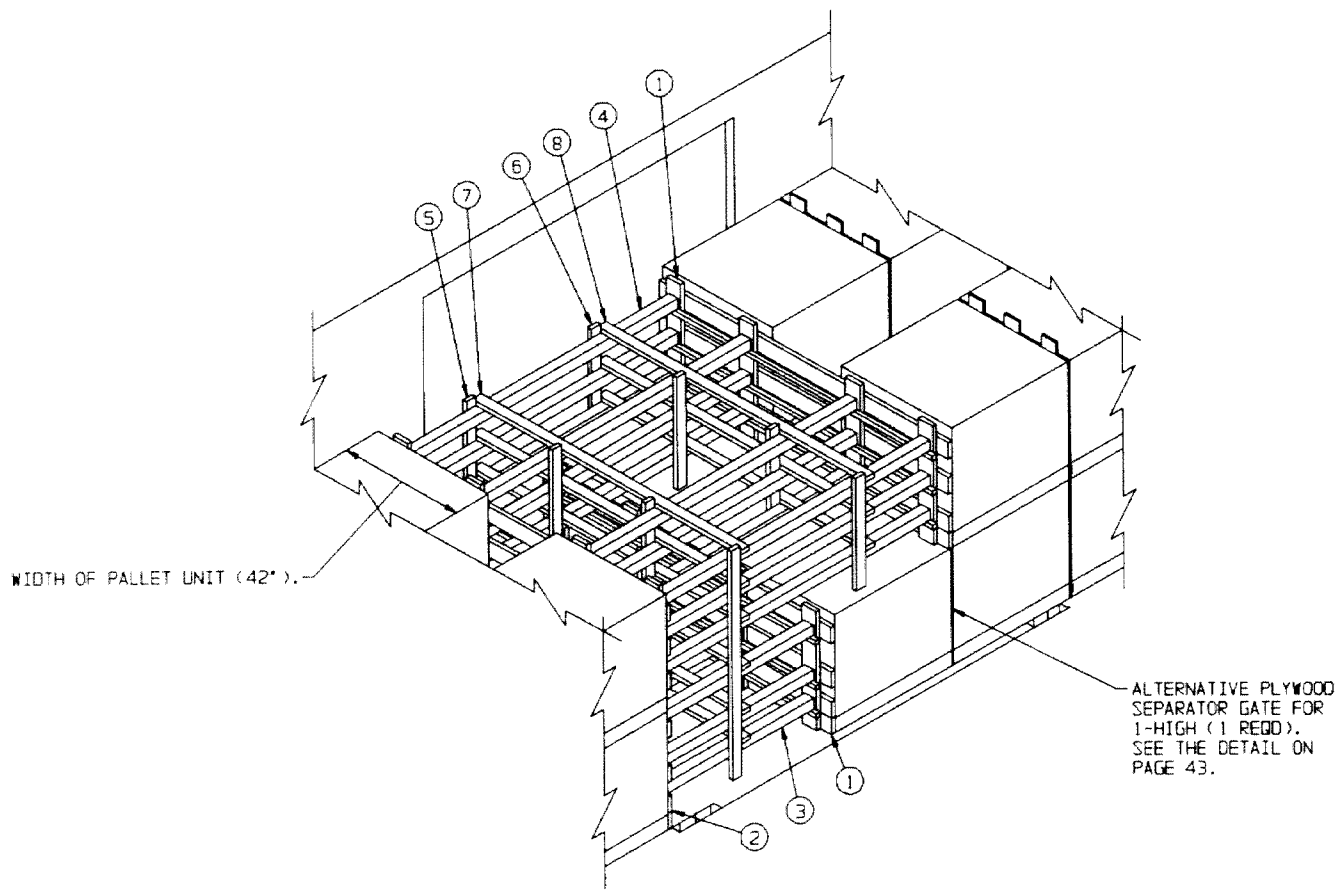
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	219	55
1" X 4"	8	3
1" X 6"	498	249
1" X 8"	17	12
2" X 4"	286	191
2" X 6"	21	21
4" X 4"	21	28
NAILS	NO. REQD	POUNDS
6d (2")	440	2-3/4
10d (3")	276	4-1/4
12d (3-1/4")	40	3/4
16d (3-1/2")	28	3/4
STEEL STRAPPING, 1-1/4"	66' REQD	10 LBS
SEAL FOR 1-1/4" STRAPPING	4 REQD	NIL
WIRE, NO. 14 GAGE	80' REQD	1-1/2 LBS
STAPLE, 15/16" X 3/4"	4 REQD	NIL

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	48	90,384 LBS
DUNNAGE		1,138 LBS
TOTAL WEIGHT		91,522 LBS (APPROX)

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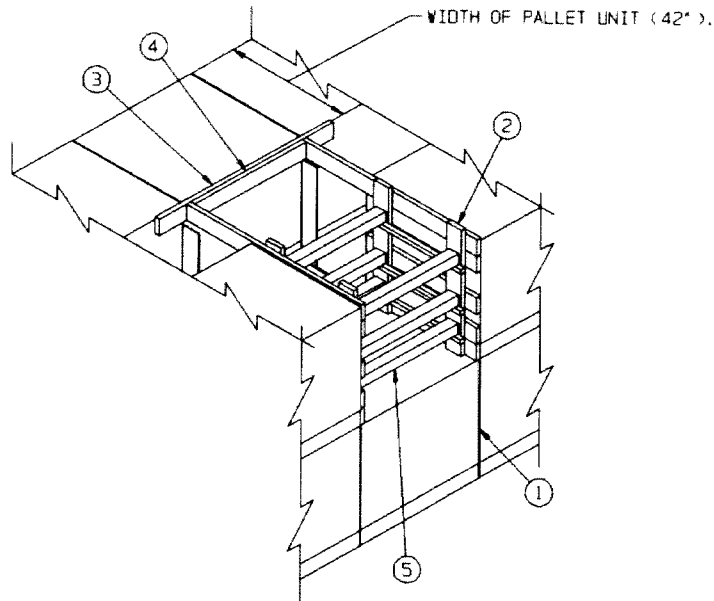
ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS AND CARS OF OTHER LENGTHS CAN ALSO BE USED. SEE SPECIAL NOTE 3.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN. REFER TO PAGE 8 FOR LATERAL BRACING AND DOORWAY PROTECTION REQUIREMENTS.
3. THE DEPICTED PROCEDURES ARE APPLICABLE FOR A 50'-6" LONG CAR. THE PROCEDURES ARE ADAPTABLE FOR THE OMISSION OF TWO PALLET UNITS FROM THE LOAD IN A 60'-8" LONG CAR SHOWN ON PAGE 6. IF A FULL LOAD MINUS TWO PALLET UNITS IS TO BE SHIPPED, ONLY ONE SET OF STRUT BRACING, PIECES MARKED ⑤ AND ⑦, WILL BE REQUIRED.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 37. SEE GENERAL NOTE "M" ON PAGE 2. SEE SPECIAL NOTES 2 AND 3 AT LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 37.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL $\frac{1}{2}$ -16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "T" AND "U" ON PAGE 3.
- ④ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN PIECES MARKED ① AND ② IN THE SECOND LAYER AND TOENAIL $\frac{1}{2}$ -16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTES "T" AND "U" ON PAGE 3.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 6'-5" (4 REQD). NAIL TO THE STRUTS MARKED ③ AND ④ $\frac{1}{3}$ -10d NAILS AT EACH JOINT. SEE GENERAL NOTE "T" ON PAGE 3.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 38" (4 REQD). NAIL TO THE STRUTS MARKED ④ $\frac{1}{3}$ -10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 5" IN LENGTH (6 REQD). NAIL TO THE STRUTS MARKED ③ AND/OR ④ $\frac{1}{3}$ -10d NAILS AT EACH JOINT.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 5" IN LENGTH (3 REQD). NAIL TO THE STRUTS MARKED ④ $\frac{1}{3}$ -10d NAILS AT EACH JOINT.



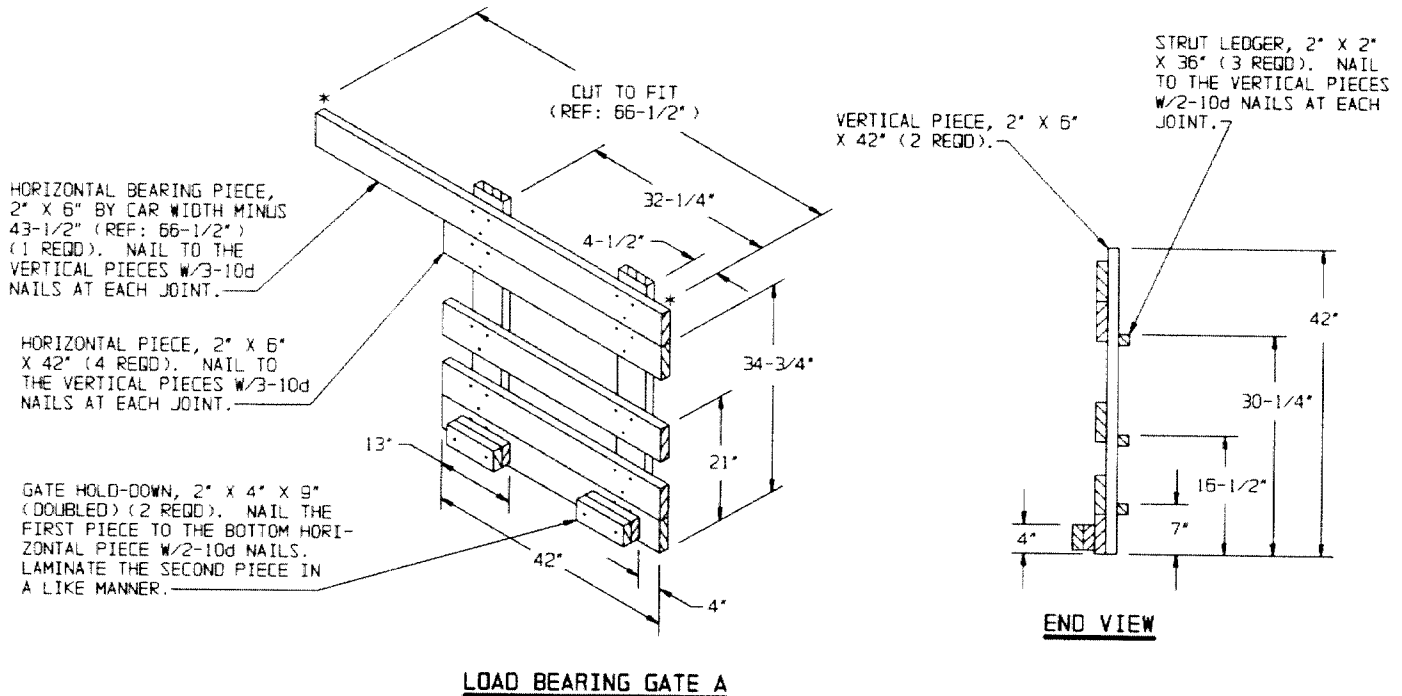
ISOMETRIC VIEW

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. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A PALLET UNIT FROM A 1-LAYER LOAD.
3. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 6 OR 8 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECE IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS DIMENSION WILL HAVE TO BE INCREASED WHEN LOADING WIDER CARS.

KEY NUMBERS

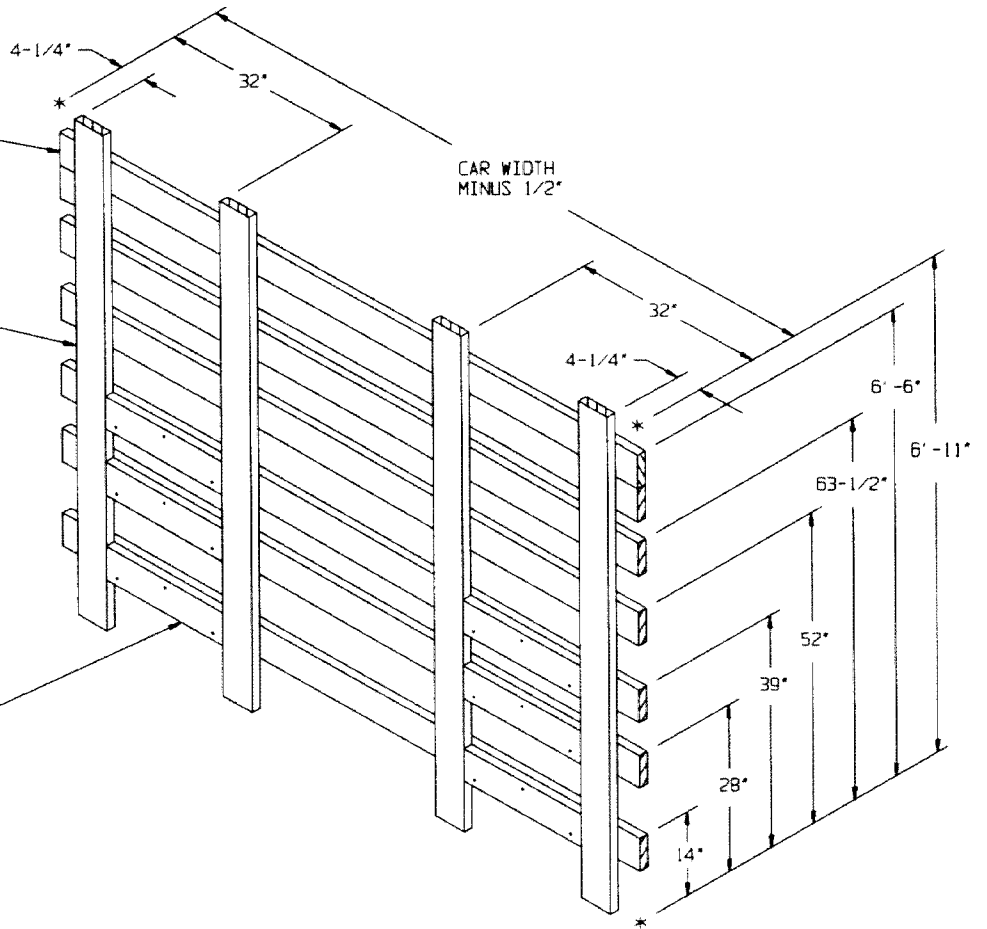
- ① ALTERNATIVE PLYWOOD SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 41.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE A" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED ④, W/3-10d NAILS.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 66" (1 REQD).
- ④ FILLER PIECE, 2" X 6" X 42-1/2" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ③, W/5-10d NAILS.
- ⑤ STRUT, 4" X 4" X 39-1/2" (6 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.



HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" (7 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 6'-11" (4 REQD).

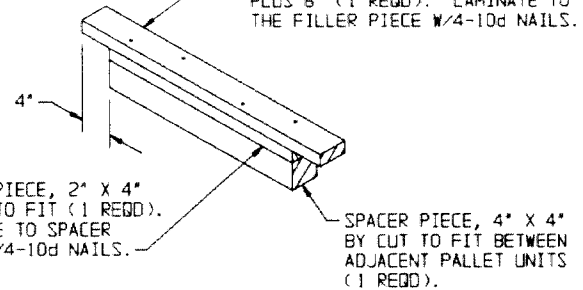
FILLER PIECE, 2" X 6" X 22-1/4" (6 REQD). NAIL TO A HORIZONTAL PIECE W/3-10d NAILS.



KNEE BRACE GATE

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 20 AND IS IDENTIFIED THEREIN AS PIECE MARKED ④.

SUPPORT PIECE, 2" X 4" BY WIDTH OF VOID BETWEEN ROWS OF UNITS PLUS 8" (1 REQD). LAMINATE TO THE FILLER PIECE W/4-10d NAILS.

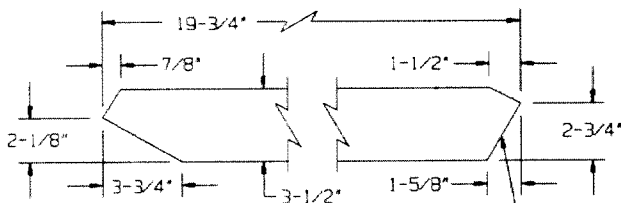


FILLER PIECE, 2" X 4" BY CUT TO FIT (1 REQD). LAMINATE TO SPACER PIECE W/4-10d NAILS.

SPACER PIECE, 4" X 4" BY CUT TO FIT BETWEEN ADJACENT PALLET UNITS (1 REQD).

SPACER ASSEMBLY C

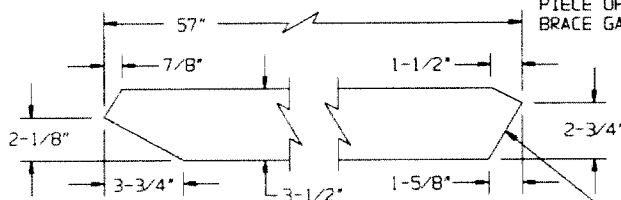
THIS ASSEMBLY IS FOR USE IN THE LOAD SHOWN ON PAGE 20 AND IS IDENTIFIED THEREIN AS PIECE MARKED ⑦.



SHORT KNEE BRACE

4" X 4" MATERIAL

THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE OF THE KNEE BRACE GATE.



LONG KNEE BRACE

4" X 4" MATERIAL

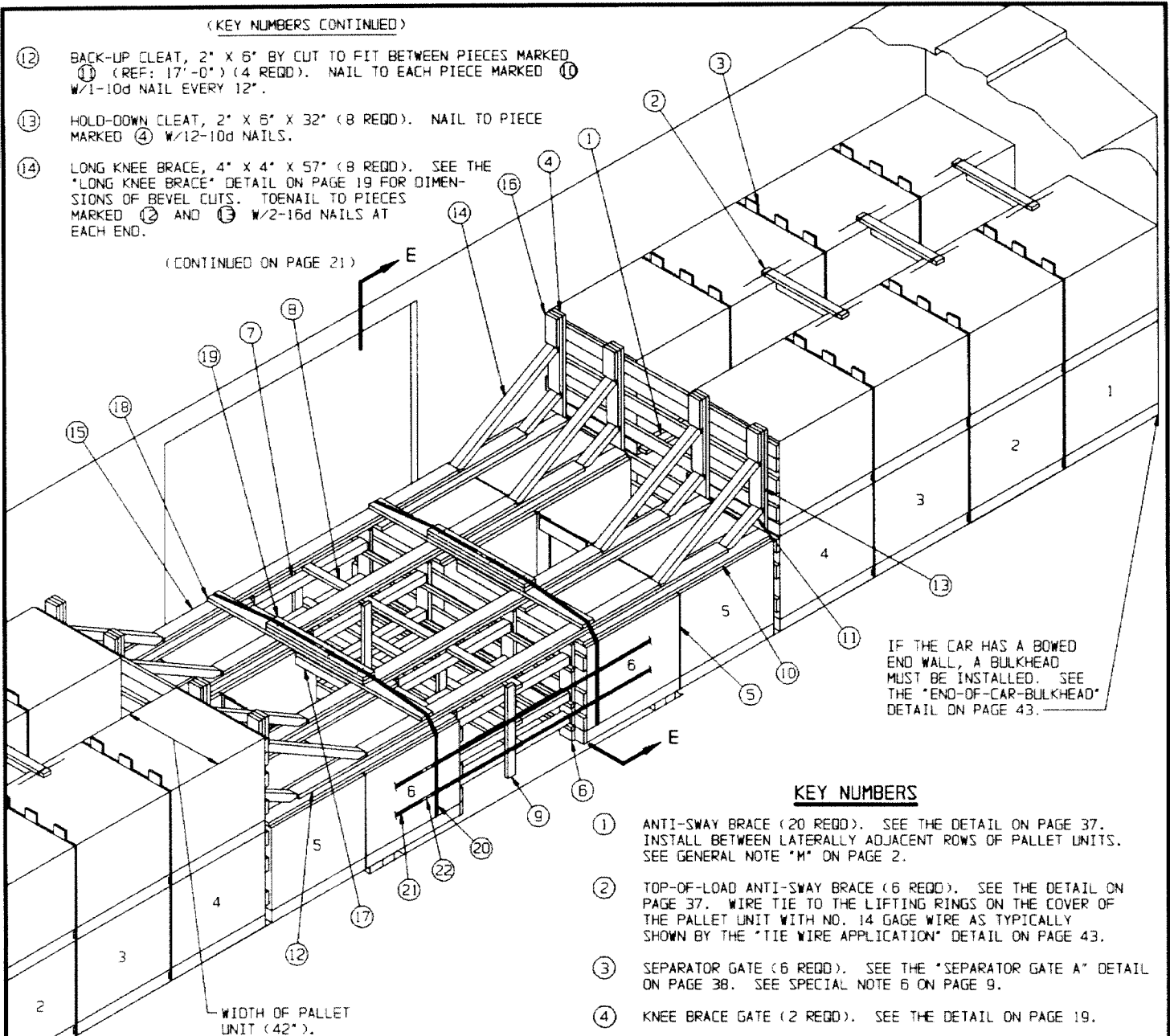
THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH PIECE MARKED ⑬.

DETAILS

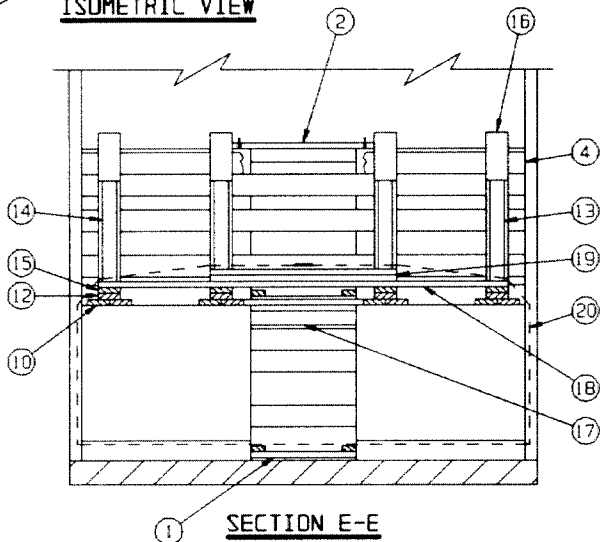
(KEY NUMBERS CONTINUED)

- ⑫ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT BETWEEN PIECES MARKED ⑪ (REF: 17'-0") (4 REQD). NAIL TO EACH PIECE MARKED ⑩ W/1-10d NAIL EVERY 12".
- ⑬ HOLD-DOWN CLEAT, 2" X 6" X 32" (8 REQD). NAIL TO PIECE MARKED ④ W/12-10d NAILS.
- ⑭ LONG KNEE BRACE, 4" X 4" X 57" (8 REQD). SEE THE "LONG KNEE BRACE" DETAIL ON PAGE 19 FOR DIMENSIONS OF BEVEL CUTS. TOENAIL TO PIECES MARKED ② AND ③ W/2-16d NAILS AT EACH END.

(CONTINUED ON PAGE 21)



ISOMETRIC VIEW

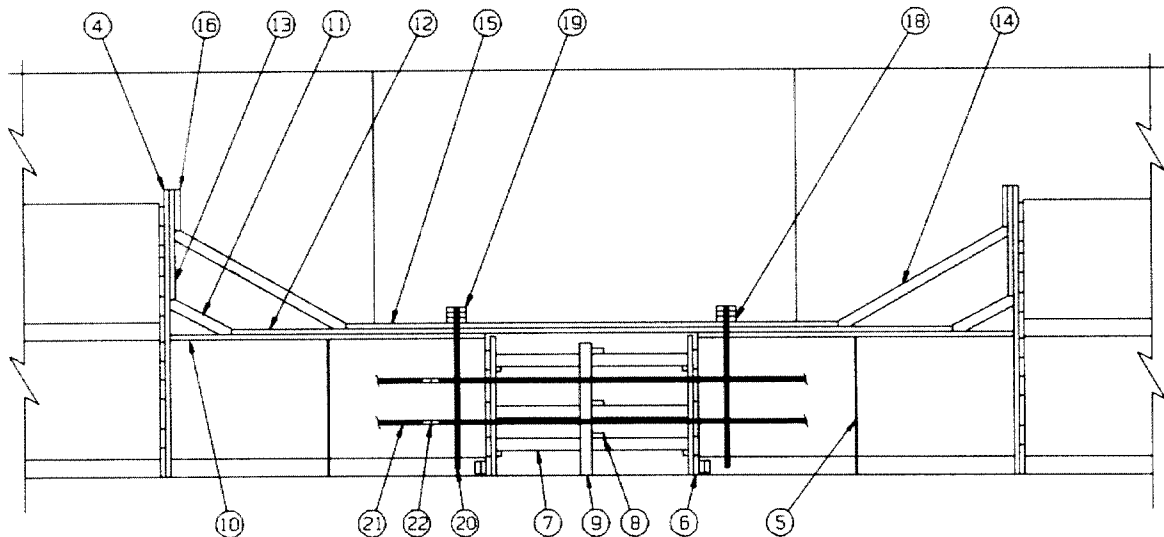


SECTION E-E

KEY NUMBERS

- ① ANTI-SWAY BRACE (20 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43.
- ③ SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. SEE SPECIAL NOTE 6 ON PAGE 9.
- ④ KNEE BRACE GATE (2 REQD). SEE THE DETAIL ON PAGE 19.
- ⑤ ALTERNATIVE SEPARATOR GATE FOR 1-HIGH (2 REQD). SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 43.
- ⑥ CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 37.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 55") (12 REQD). TOENAIL TO THE CENTER GATES, PIECES MARKED ⑥, W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON PAGE 21.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 5". NAIL TO THE STRUTS, PIECES MARKED ⑦, W/2-16d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 38" (4 REQD). NAIL TO THE STRUTS, PIECES MARKED ⑦, W/3-10d NAILS AT EACH JOINT.
- ⑩ BEARING PIECE, 2" X 6" X 7'-5" (16 REQD). POSITION TWO (2) EACH SIDE BY SIDE SO AS TO HAVE THE ENDS CENTERED AGAINST A VERTICAL PIECE OF THE KNEE-BRACE GATE, PIECE MARKED ④. TOENAIL TO THE VERTICAL PIECE W/1-12d NAIL.
- ⑪ SHORT KNEE BRACE, 4" X 4" X 19-3/4" (8 REQD). SEE THE "SHORT KNEE BRACE" DETAIL ON PAGE 19 FOR DIMENSIONS OF BEVEL-CUTS. TOENAIL TO PIECES MARKED ④ AND ⑩ W/2-16d NAILS AT EACH END.

(CONTINUED AT LEFT ABOVE)



PARTIAL ELEVATION VIEW

(KEY NUMBERS CONTINUED)

- ⑮ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT BETWEEN PIECES MARKED ⑭ (REF: 11'-8") (4 REGD). NAIL TO PIECE MARKED ⑫ W/1-10d NAIL EVERY 6".
- ⑯ HOLD-DOWN CLEAT, 2" X 6" X 12" (8 REGD). NAIL TO PIECE MARKED ⑬ W/5-16d NAILS.
- ⑰ SPACER ASSEMBLY (2 REGD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 19. NAIL TO PIECES MARKED ⑩ W/2-10d NAILS AT EACH END.
- ⑱ CROSS CAR BRACE, 2" X 6" BY CAR WIDTH MINUS 9" (2 REGD). NAIL TO PIECES MARKED ⑤ W/3-16d NAILS AT EACH JOINT. SEE SPECIAL NOTE 3 AT RIGHT.
- ⑲ STRAPPING BOARD, 2" X 6" BY WIDTH OF LATERAL VOID PLUS 19-1/2" (DOUBLED) (2 REGD). NAIL THE FIRST PIECE TO PIECE MARKED ⑥ W/1-10d NAIL EVERY 12". NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑳ HOLD-DOWN STRAP, 1-1/4" X .035" OR .031" X 26'-0" LONG STEEL STRAPPING (2 REGD). INSTALL SO AS TO ENIRCLE THE PALLET UNITS, CROSS CAR BRACE, AND STRAPPING BOARD. STAPLE TO STRAPPING BOARD W/3 STAPLES AND TO THE CROSS CAR BRACE W/1 STAPLE AT EACH END.
- ㉑ DOORWAY STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (4 REGD). INSTALL FROM TWO (2) 7'-0" LONG PIECES. SEE SPECIAL NOTE 4 AT RIGHT.
- ㉒ SEAL FOR 1-1/4" STEEL STRAPPING (20 REGD, 4 PER DOORWAY STRAP, 2 PER HOLD-DOWN STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "D" ON PAGE 2.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE 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.
2. THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING MAY BE USED IN ALL-METAL CARS OR IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER OF NOT MORE THAN 22,000 POUNDS IN EACH END OF A CAR (ELEVEN (11) PALLET UNITS).
3. A MINIMUM OF TWO (2) SETS OF SPACER ASSEMBLIES, CROSS BRACES, STRAPPING BOARDS, AND HOLD-DOWN STRAPS, PIECES MARKED ① THRU ⑳, ARE REQUIRED. FOR THOSE LOADS IN WHICH THE TOP TIER IS MORE THAN TWO UNITS SHORTER IN EACH END THAN THE LOWER TIER, AN ADDITIONAL SET OF THOSE PIECES MUST BE INSTALLED FOR EACH LOAD UNIT BETWEEN A CENTER GATE AND THE LOAD UNIT WHICH IS UNDER THE LOWER END OF THE LONG KNEE BRACES. NOTE THAT THE STRAPPING MUST BE POSITIONED UNDER THE PALLET PRIOR TO FINAL POSITIONING OF THOSE UNITS WHICH ARE NOT IN THE DOORWAY.
4. DOORWAY PROTECTION IS PROVIDED BY THE DOORWAY STRAPS, PIECES MARKED ㉑ (FOR PLUG DOORS ONLY), SECURED TO SPECIAL ANCHOR RODS IN THE CAR DOOR POSTS. IF THE CAR HAS SLIDING DOORS, OR HAS NO ANCHOR RODS, DOORWAY PROTECTION MUST BE PROVIDED BY SOME OTHER MEANS. SEE PIECE MARKED ⑩ ON PAGE 8 AND SPECIAL NOTE 11 ON PAGE 9. NOTE THAT THE HOLD-DOWN STRAPS, PIECES MARKED ㉒, WILL ALSO PROVIDE FOR DOORWAY PROTECTION IF DOORWAY BLOCKING AS SHOWN BY THE "ALTERNATIVE DOORWAY PROTECTION D" DETAIL ON PAGE 49 IS SUBSTITUTED FOR THE ANTI-SWAY BRACES, PIECES MARKED ①, BETWEEN THOSE UNITS IN THE DOORWAY. THE SPACER ASSEMBLY, PIECE MARKED ⑰, WILL BE USED UNDER ALL DOORWAY PROTECTION STRAPS IN LIEU OF THE "SPACER ASSEMBLY B" SPECIFIED IN "ALTERNATIVE DOORWAY PROTECTION D".
5. IF DESIRED, DOUBLE 2" X 6" STRUTS MAY BE USED IN LIEU OF THE DEPICTED 4" X 4" STRUTS, PIECES MARKED ⑦. LAMINATE W/1-10d NAILS EVERY 6". TOENAIL TOP PIECE TO GATES W/2-12d NAILS AT EACH END.

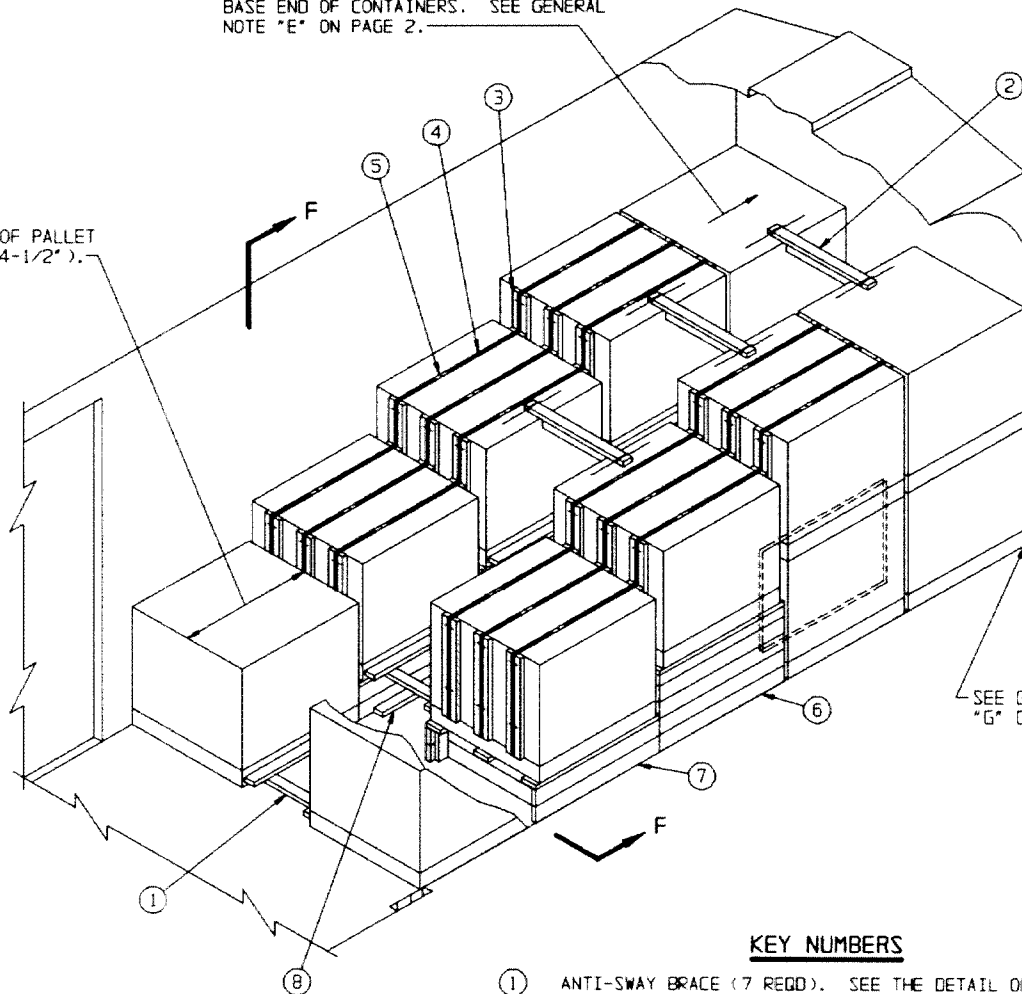
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	110	28
1" X 6"	253	127
2" X 2"	102	34
2" X 4"	346	231
2" X 6"	595	595
4" X 4"	111	148
NAILS	NO. REGD	POUNDS
6d (2")	216	1-1/2
10d (3")	924	14-1/4
12d (3-1/4")	46	1
16d (3-1/2")	176	4
STEEL STRAPPING, 1-1/4" X .035" OR .031" - 108' REGD - - - - 16 LBS		
SEAL FOR 1-1/4" STRAPPING - - 20 REGD - - - - 1 LB		
WIRE, NO. 14 GAGE - - - - 60' REGD - - - - NIL		
STAPLES - - - - - 10 REGD - - - - NIL		
PLYWOOD, 3/8" - - - - 27 SQ FT REGD - - - - 28 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	40	75,320 LBS
DUNNAGE		2,392 LBS
TOTAL WEIGHT		77,712 LBS (APPROX)

THE DIRECTION OF THE ARROW INDICATES
BASE END OF CONTAINERS. SEE GENERAL
NOTE "E" ON PAGE 2.

LENGTH OF PALLET
UNIT (44-1/2').

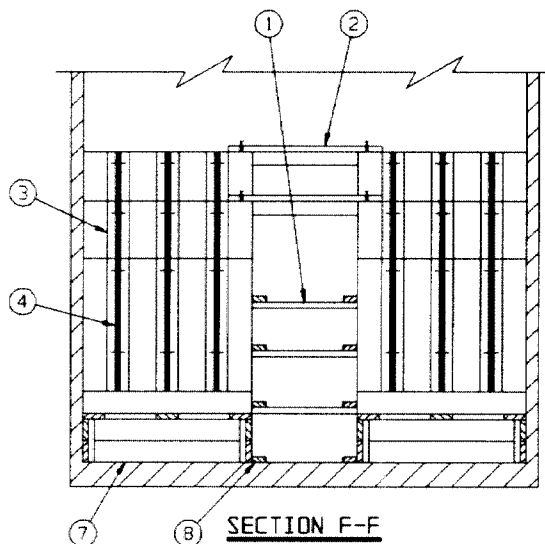


SEE GENERAL NOTE
"G" ON PAGE 2.

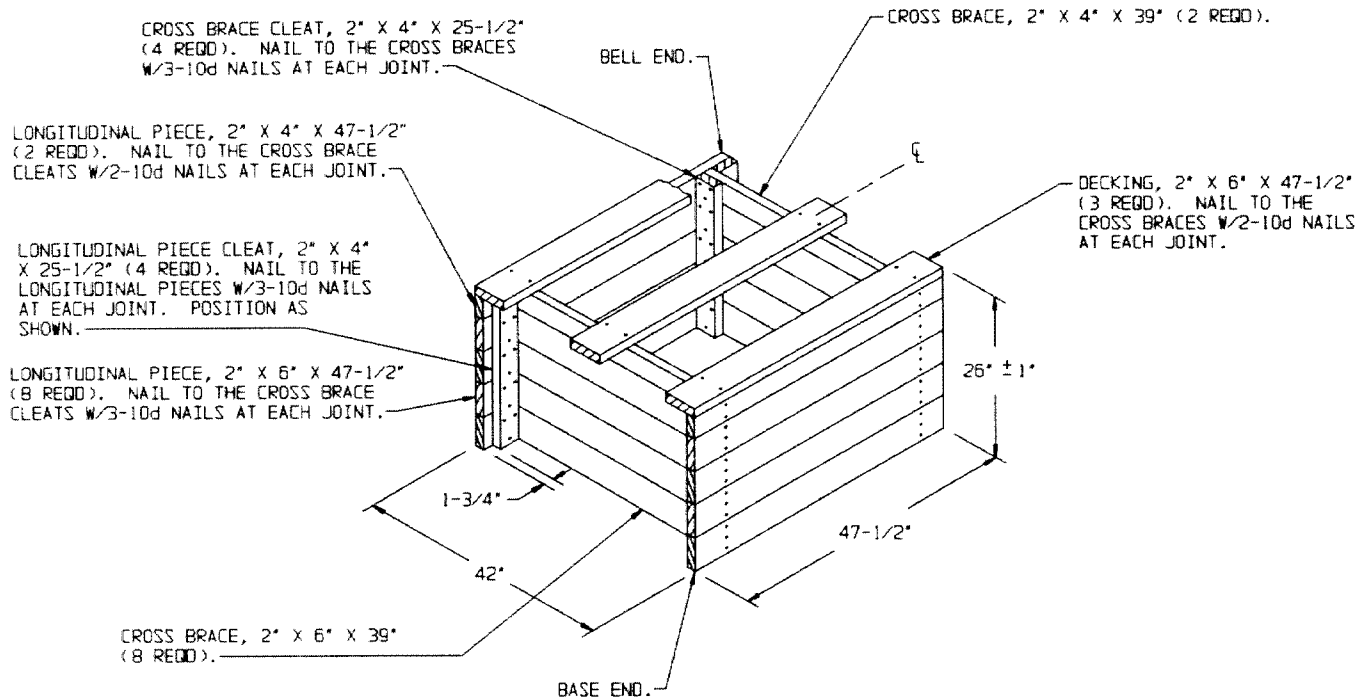
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43.
- ③ STRAPPING BOARD, 2" X 6" X 34-1/2" (48 REQD/6 PER PALLET UNIT). POSITION SO AS TO BE CENTERED ON THE OUTER TWO STACKS OF CONTAINERS AND ON THE JOINT OF THE CENTER TWO CONTAINERS.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 15'-0" LONG (REF) STEEL STRAPPING (24 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS, PIECE MARKED ③. SECURE TO A STRAPPING BOARD W/3 STAPLES.
- 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). SEE THE "RISER ASSEMBLY A" DETAIL ON PAGE 23.
- ⑦ RISER ASSEMBLY (2 REQD). SEE THE "RISER ASSEMBLY B" DETAIL ON PAGE 23.
- ⑧ RISER STOP PIECE, 2" X 4" X 36" (4 REQD). POSITION AGAINST A RISER ASSEMBLY AND NAIL TO THE CAR FLOOR W/3-16d NAILS.



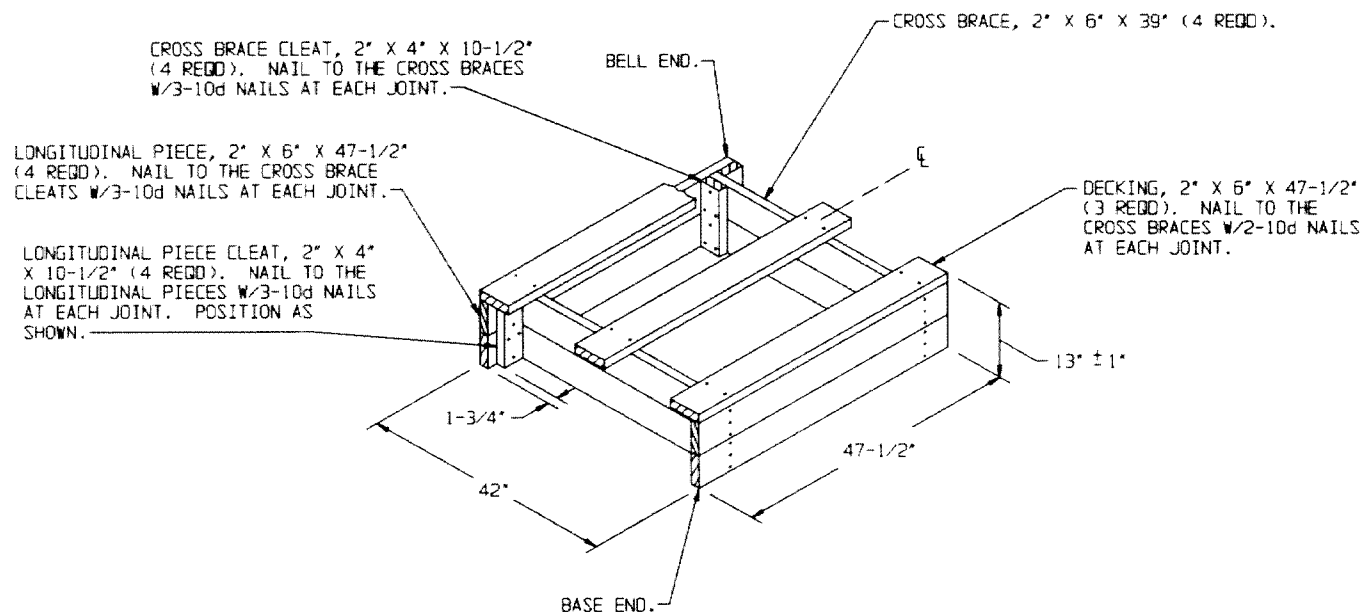
SECTION F-F



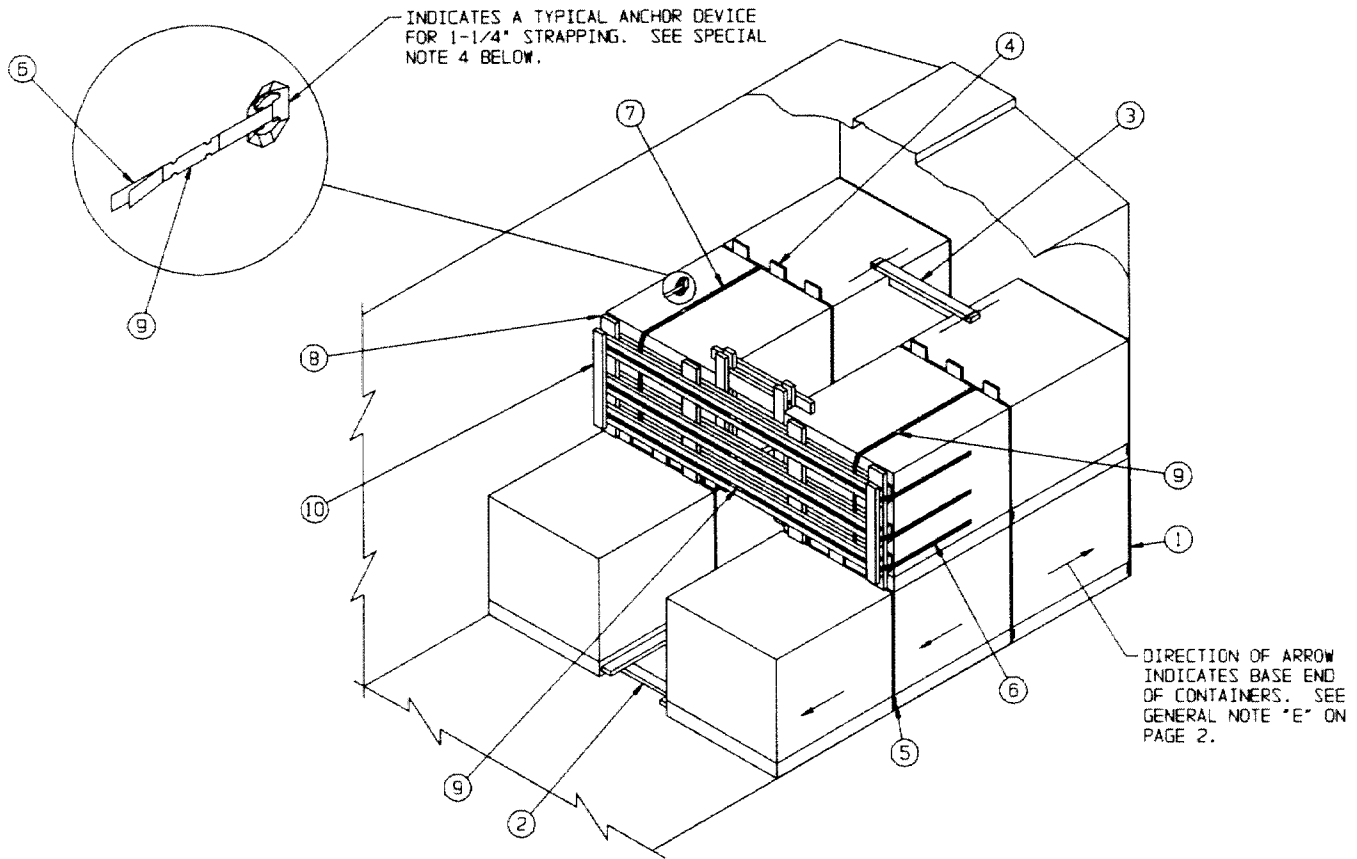
RISER ASSEMBLY A

SPECIAL NOTES FOR LOAD:

1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. THE RISER METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR PALLET UNITS POSITIONED LENGTHWISE IN THE CAR.
3. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO PAGE 6 OR 8 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



RISER ASSEMBLY B



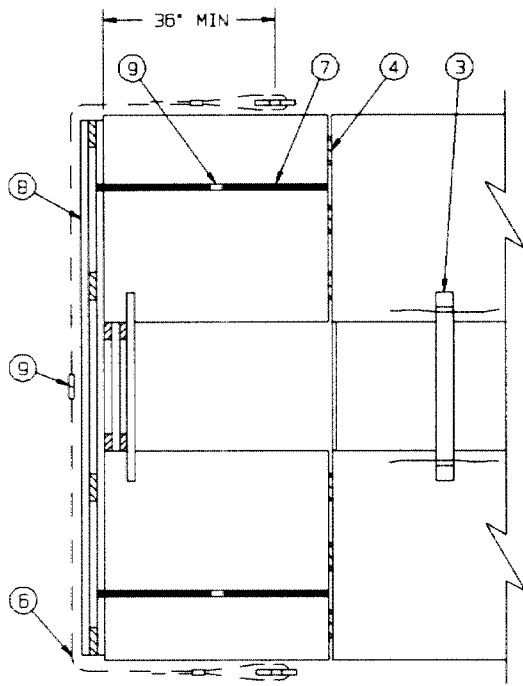
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE ALL-METAL BOX CAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED PALLET UNITS AS SHOWN IN THE VIEW ABOVE.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,000 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 5,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS. A BULKHEAD GATE WITH 2 STRAPS WILL RETAIN 2 PALLET UNITS; A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN 4 PALLET UNITS.
4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 17 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 18 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 25 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 END-WALL LINING (1 REQD). SEE THE DETAIL ON PAGE 42. SEE GENERAL NOTE "O" ON PAGE 2. NOTE THAT IF AN END-OF-CAR BULKHEAD, AS DETAILED ON PAGE 43 IS USED, THE END-WALL LINING IS NOT REQUIRED.
- ② ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43.
- ④ SEPARATOR GATE FOR 2-HIGH LOAD (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS.
- ⑤ SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38.
- ⑥ 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 25 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 AND 4 AT LEFT.
- ⑦ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 15'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT AND THE HORIZONTAL PIECES OF THE BULKHEAD GATE. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ⑥.
- ⑧ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 25. SEE SPECIAL NOTE 3 AT LEFT.
- ⑨ SEAL FOR 1-1/4" STEEL STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ⑥, AND 1 PER BUNDLING STRAP, PIECE MARKED ⑦). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- 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.



STRAP APPLICATION PLAN VIEW

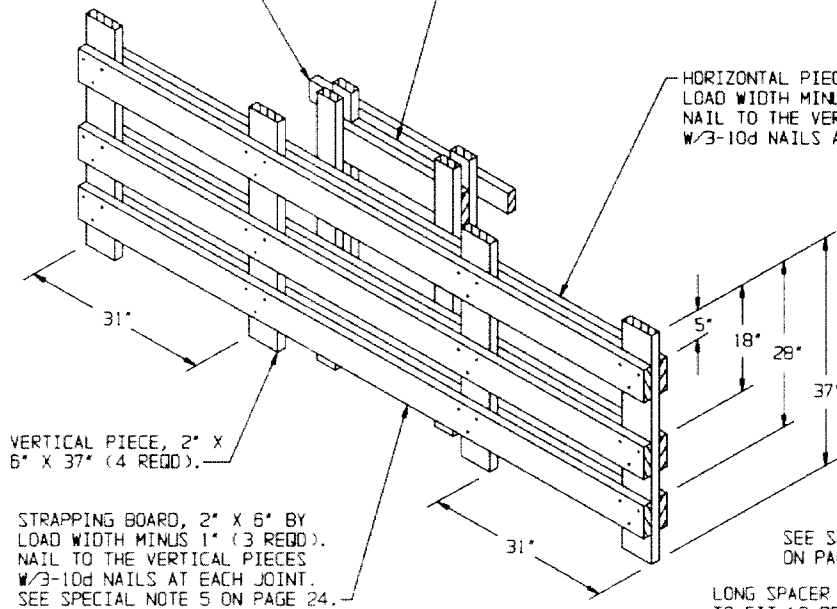
THE ANTI-SWAY BRACES, PIECES MARKED ②, HAVE BEEN OMITTED FOR CLARITY.

SUPPORT PIECE, 2" X 4" BY LATERAL VOID PLUS 12" (1 REQD). NAIL TO THE RISER PIECES W/3-10d NAILS AT EACH JOINT.

SHORT SPACER PIECE, 2" X 6" BY CUT TO FIT BETWEEN THE RISER PIECES (2 REQD). NAIL TO THE LONG SPACER PIECE W/5-10d NAILS.

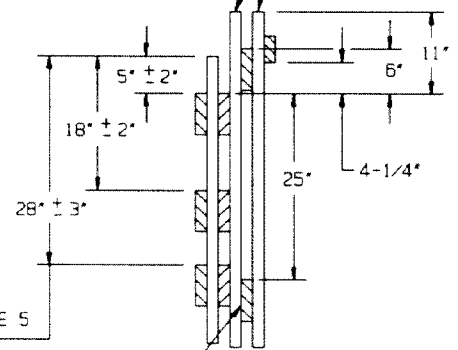
HORIZONTAL PIECE, 2" X 6" BY LOAD WIDTH MINUS 1" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

RISER PIECE, 2" X 4" X 45" (4 REQD). NAIL TO THE SPACER PIECES W/3-10d NAILS AT EACH JOINT.



VERTICAL PIECE, 2" X 6" X 37" (4 REQD).

STRAPPING BOARD, 2" X 6" BY LOAD WIDTH MINUS 1" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 24.

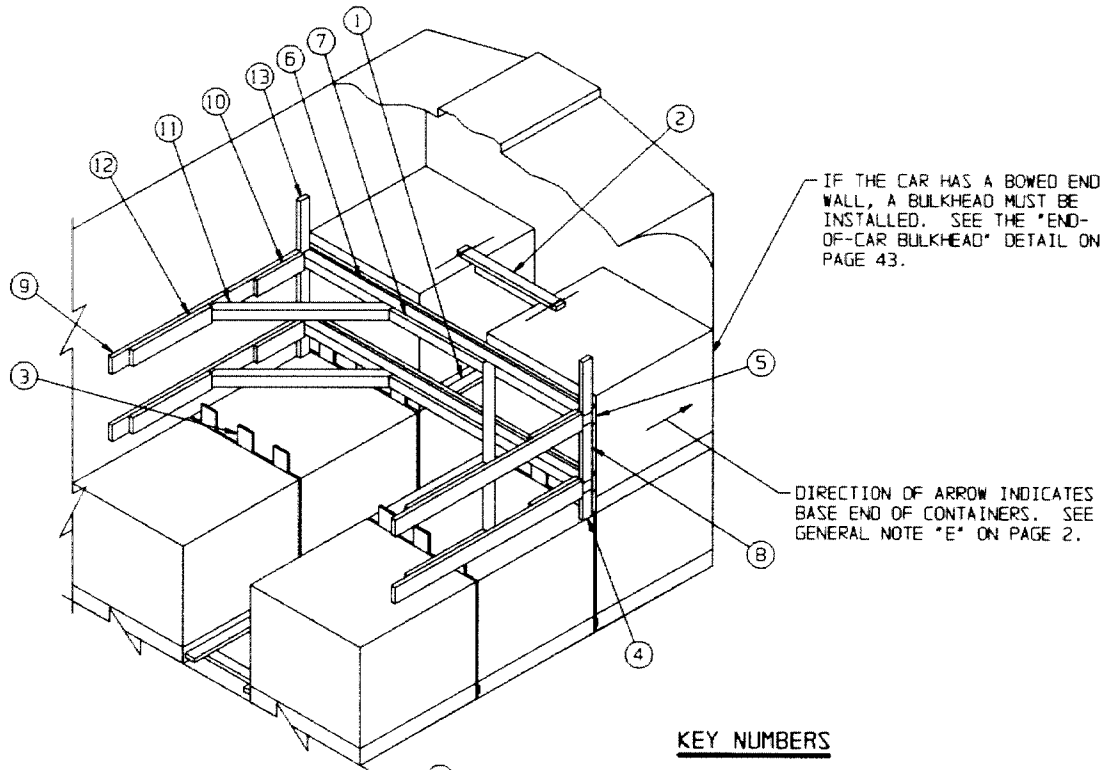


SEE SPECIAL NOTE 5 ON PAGE 24.

LONG SPACER PIECE, 2" X 6" BY CUT TO FIT (2 REQD). NAIL TO RISER PIECES W/3-10d NAILS AT EACH JOINT.

BULKHEAD GATE

END VIEW



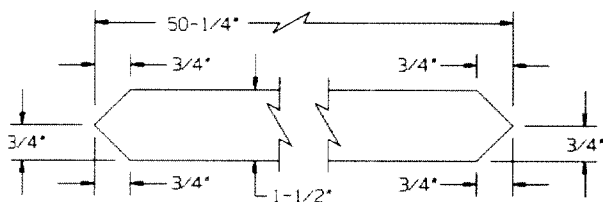
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 37. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SEPARATOR GATE FOR 1-HIGH (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 38.
- ④ SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ⑤ AND ⑥ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ⑤ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/1-12d NAIL EVERY 6"
- ⑥ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).
- ⑦ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, W/7-16d NAILS. SEE SPECIAL NOTE 4 AT LEFT.
- ⑧ SPACER CLEAT, 2" X 4" X 19" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑨ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑩ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/4-16d NAILS.
- ⑪ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑥, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/2-16d NAILS AT EACH END.
- ⑫ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑨, W/8-16d NAILS.
- ⑬ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

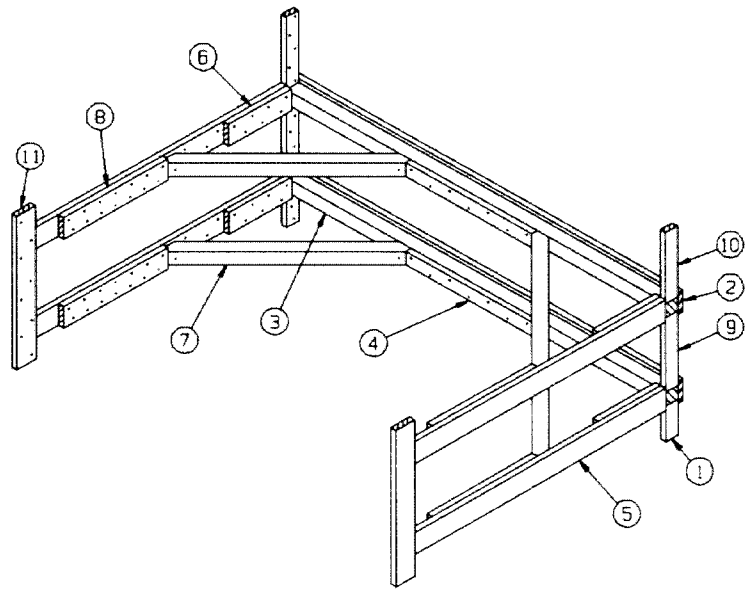
- 1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
- 2. PARTIAL-LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. IF ONLY ONE PALLET UNIT IS TO BE SHIPPED IN A PARTIAL SECOND LAYER, IT WILL BE POSITIONED DIRECTLY ABOVE THE LOWER PALLET UNIT. FOR A PARTIAL FIRST LAYER POSITION THE PALLET UNIT IN ONE CORNER. PROVIDE LATERAL BRACING BY APPLYING VERTICALLY POSITIONED DOUBLED 2" X 4" X 48" LONG PIECES TO THE CAR END WALL AND TO THE K-BRACE. NAIL TO THE CAR END WALL W/6-12d NAILS EACH LAYER. THE FIRST PIECE APPLIED TO THE K-BRACE WILL BE NAILED TO PIECE MARKED ⑤ W/3-12d NAILS EACH JOINT. LAMINATE THE SECOND PIECE W/6-12d NAILS. IF IT IS NECESSARY TO BRACE MORE PALLET UNITS, REFER TO THE DETAILS ON PAGES 27, 28 OR 29 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
- 3. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL SECOND TIER OR FIRST TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN FOUR (4) PALLET UNITS.
- 4. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑦, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.



DIAGONAL BRACE

SPECIAL NOTES:

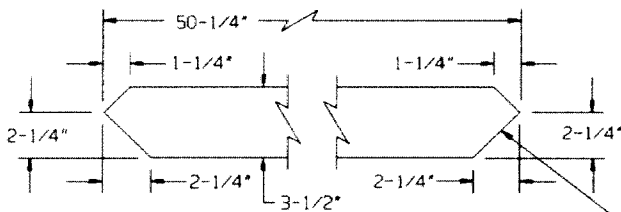
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN SIX (6) PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN SIX PALLET UNITS, REFER TO THE DETAILS ON PAGES 28 AND 29 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF ONLY TWO OR FOUR PALLET UNITS ARE TO BE SHIPPED IN THE PARTIAL LAYER, THE TYPE "A" K-BRACE DEPICTED ON PAGE 26 MAY BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, ⑩, AND ⑪, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 26 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- 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 NOTE "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 19" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 6" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" X 39" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

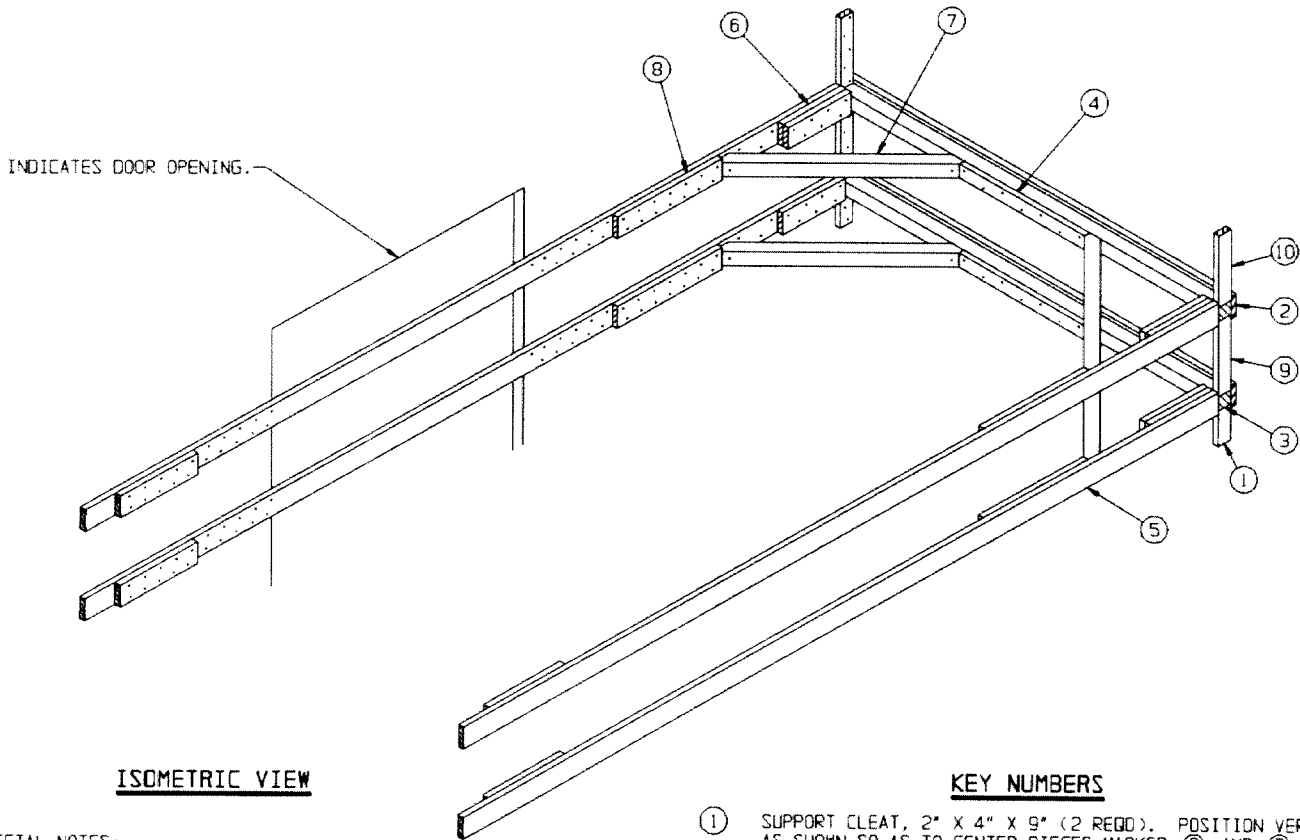


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "B" K-BRACE



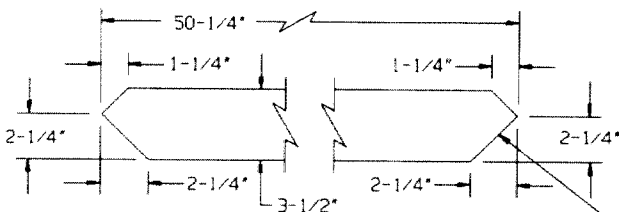
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN TEN (10) PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN TEN PALLET UNITS, REFER TO THE DETAIL ON PAGE 29 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 ONLY SIX PALLET UNITS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 27 MAY BE USED. IF THE PARTIAL TIER IS ONLY TWO OR FOUR PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 26 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, AND ⑩ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

- ① SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- 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 NOTE "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" 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 19" FOR A LENGTHWISE LOAD, 2" X 4" X 28-1/2" FOR A CROSSWISE LOAD (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



DIAGONAL BRACE

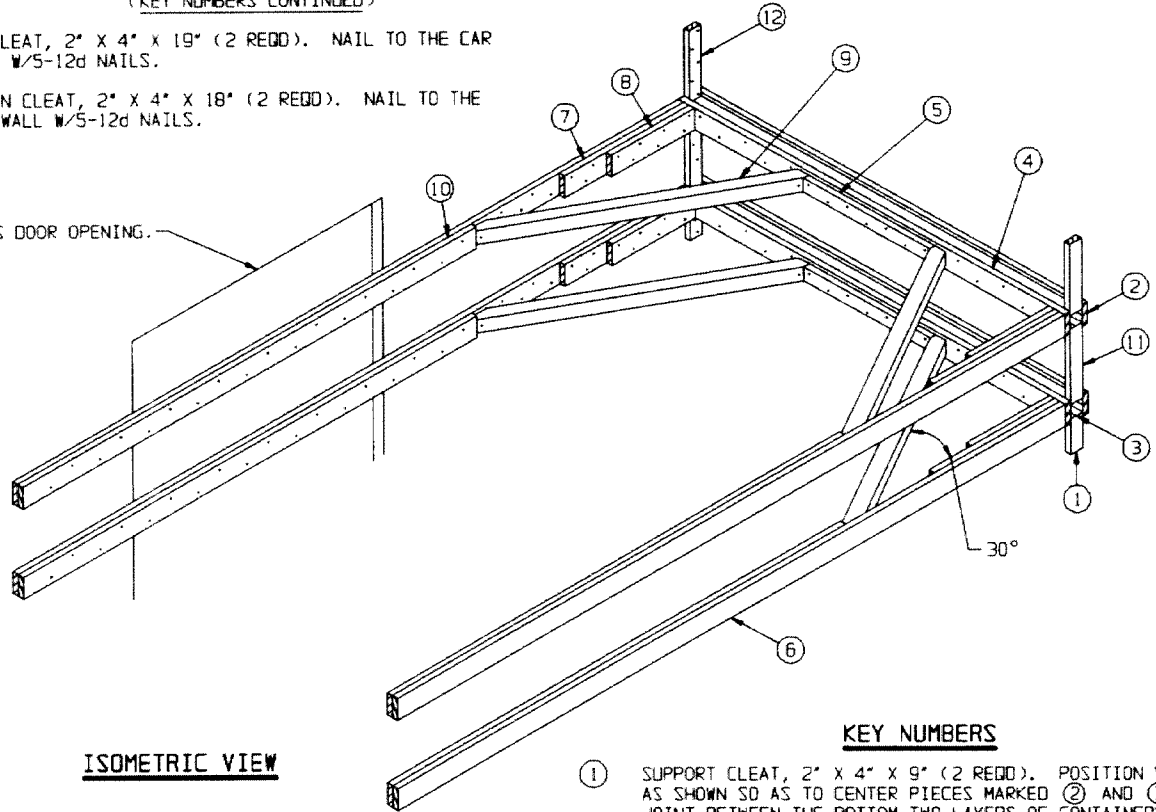
SEE SPECIAL NOTE 2 ABOVE.

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

(KEY NUMBERS CONTINUED)

- ⑪ SPACER CLEAT, 2" X 4" X 19" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

INDICATES DOOR OPENING.



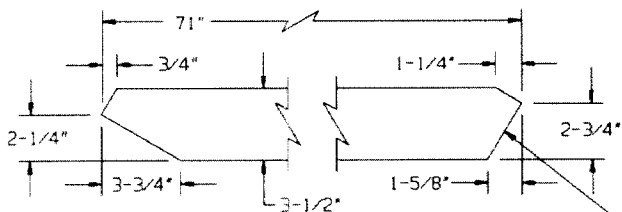
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 9" (2 REQD). POSITION VERTICALLY AS SHOWN SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- 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 NOTE "M" 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 OPENINGS 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.

SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN TWELVE (12) PALLET UNITS. IF THE PARTIAL TIER TO BE BRACED IS ONLY TEN PALLET UNITS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 28 MAY BE USED. IF SIX PALLET UNITS ARE TO BE SHIPPED, THE TYPE "B" K-BRACE DEPICTED ON PAGE 27 MAY BE USED. IF THE PARTIAL TIER IS ONLY TWO OR FOUR PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 26 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.



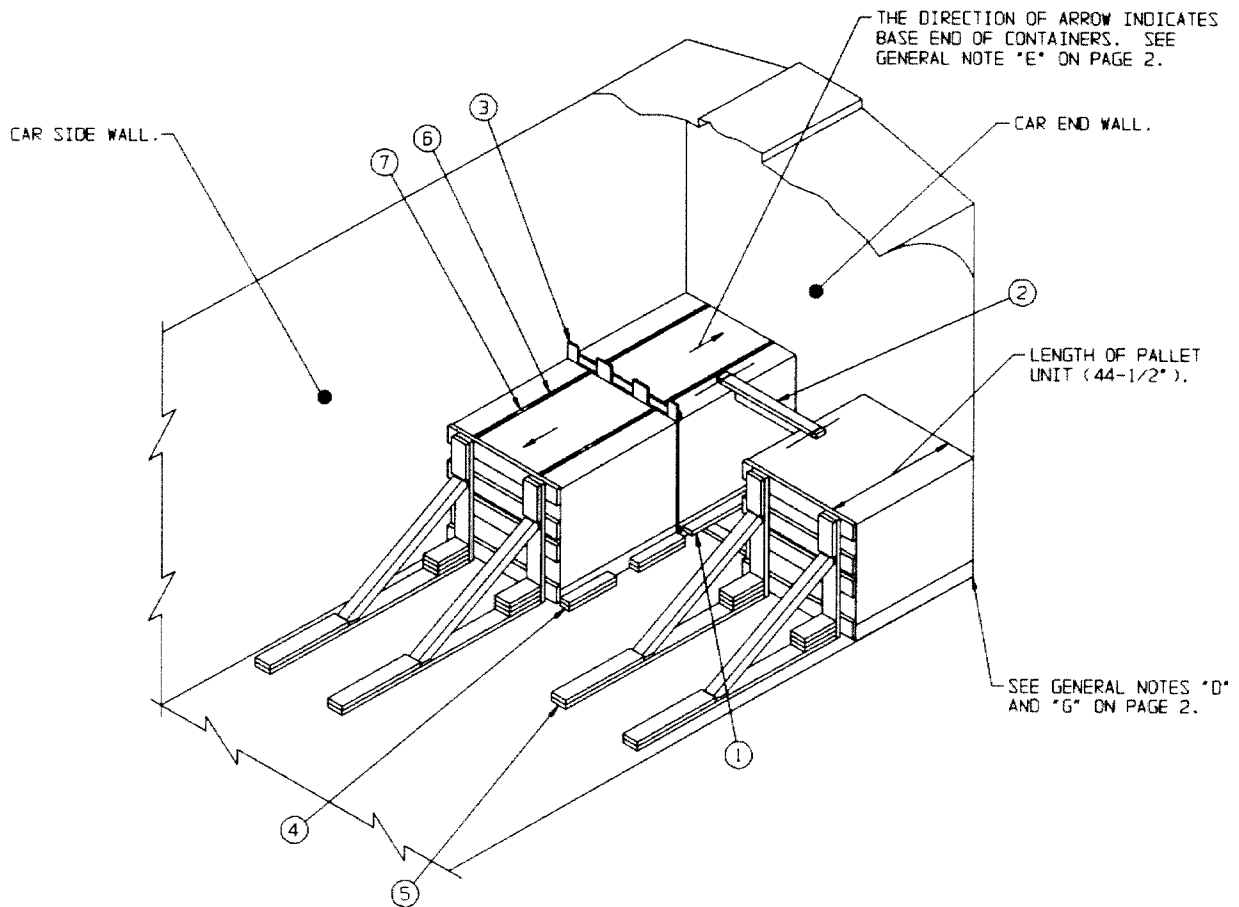
DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "D" K-BRACE

(CONTINUED AT LEFT ABOVE)



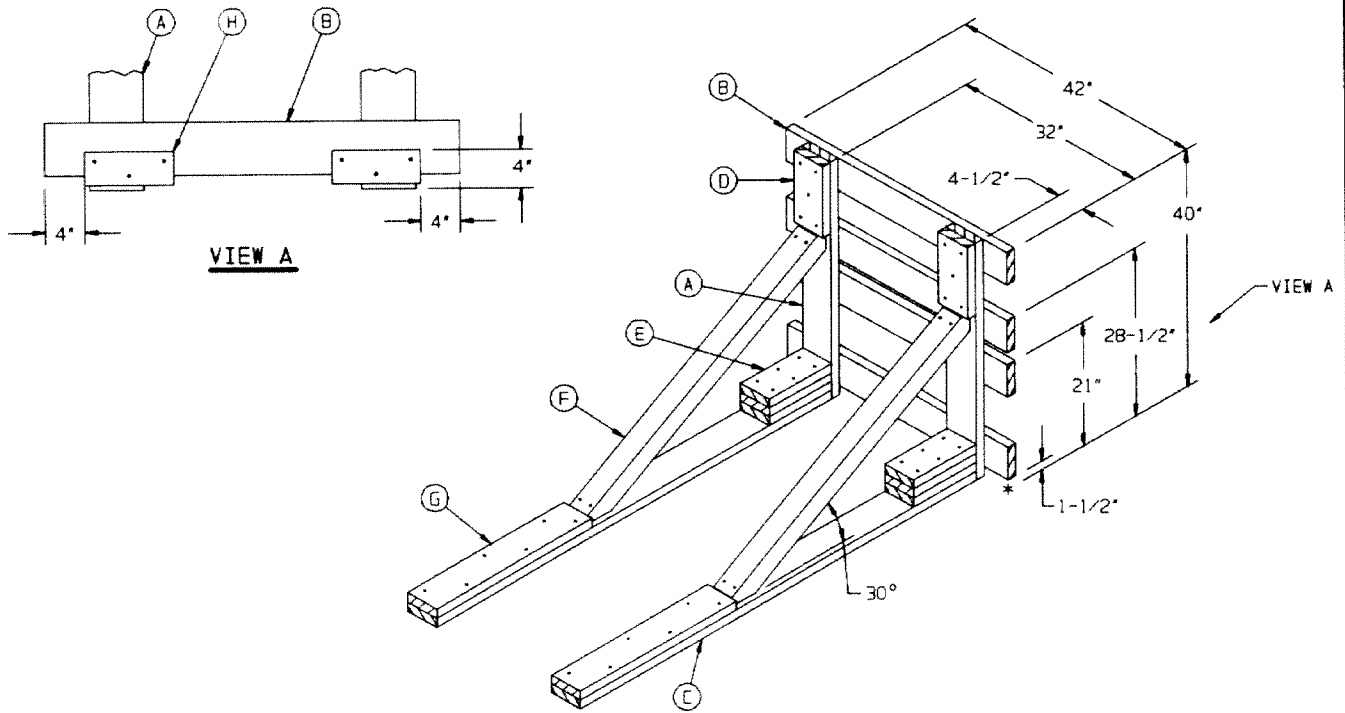
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 4 ARE NOT EXCEEDED.
3. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN FOUR (4) PALLET UNITS. AN ADDITIONAL "KNEE" MAY BE ADDED IF IT IS NECESSARY TO BRACE FIVE (5) OR SIX (6) PALLET UNITS.

KEY NUMBERS

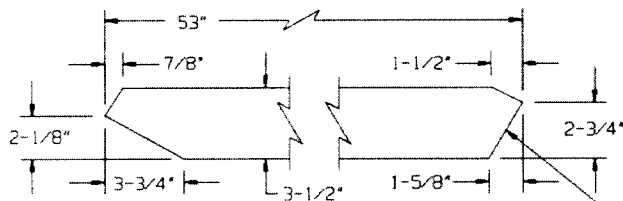
- ① ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 37.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 37. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 43.
- ③ SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 39. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNIT.
- ④ SIDE BLOCKING, 2" X 4" X 18" (DOUBLED) (2 REQD). POSITION AS SHOWN WITH ONE TO EXTEND PAST THE END OF THE UNIT AND THE SEPARATOR GATE, PIECE MARKED ③; POSITION THE OTHER AT THE OPPOSITE END OF THE UNIT. NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑤ KNEE BRACE ASSEMBLY (2 REQD). SEE THE "KNEE BRACE ASSEMBLY" DETAIL ON PAGE 31.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 15'-0" LONG STEEL STRAPPING (2 REQD). PREPOSITION. NOTE THAT STRAPPING MUST EXTEND THRU THE FORK OPENINGS OF THE PALLET AND ALSO MUST BE THREADED THRU THE SEPARATOR GATE, PIECE MARKED ③.
- ⑦ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.



KNEE BRACE ASSEMBLY

KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" X 40" (2 REQD). NAIL TO A FLOOR CLEAT, PIECE MARKED (C), W/3-16d NAILS.
- (B) HORIZONTAL PIECE, 2" X 6" X 42" (4 REQD). NAIL TO THE VERTICAL PIECES, PIECE MARKED (A), W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE *M* ON PAGE 2.
- (C) FLOOR CLEAT, 2" X 6" X 6'-4" (2 REQD). NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE *R* ON PAGE 3.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE, PIECE MARKED (A), W/5-10d NAILS.
- (E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.
- (F) BRACE, 4" X 4" X 53" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL-CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE *VIEW A* DETAIL ABOVE FOR LOCATION DIMENSIONS.

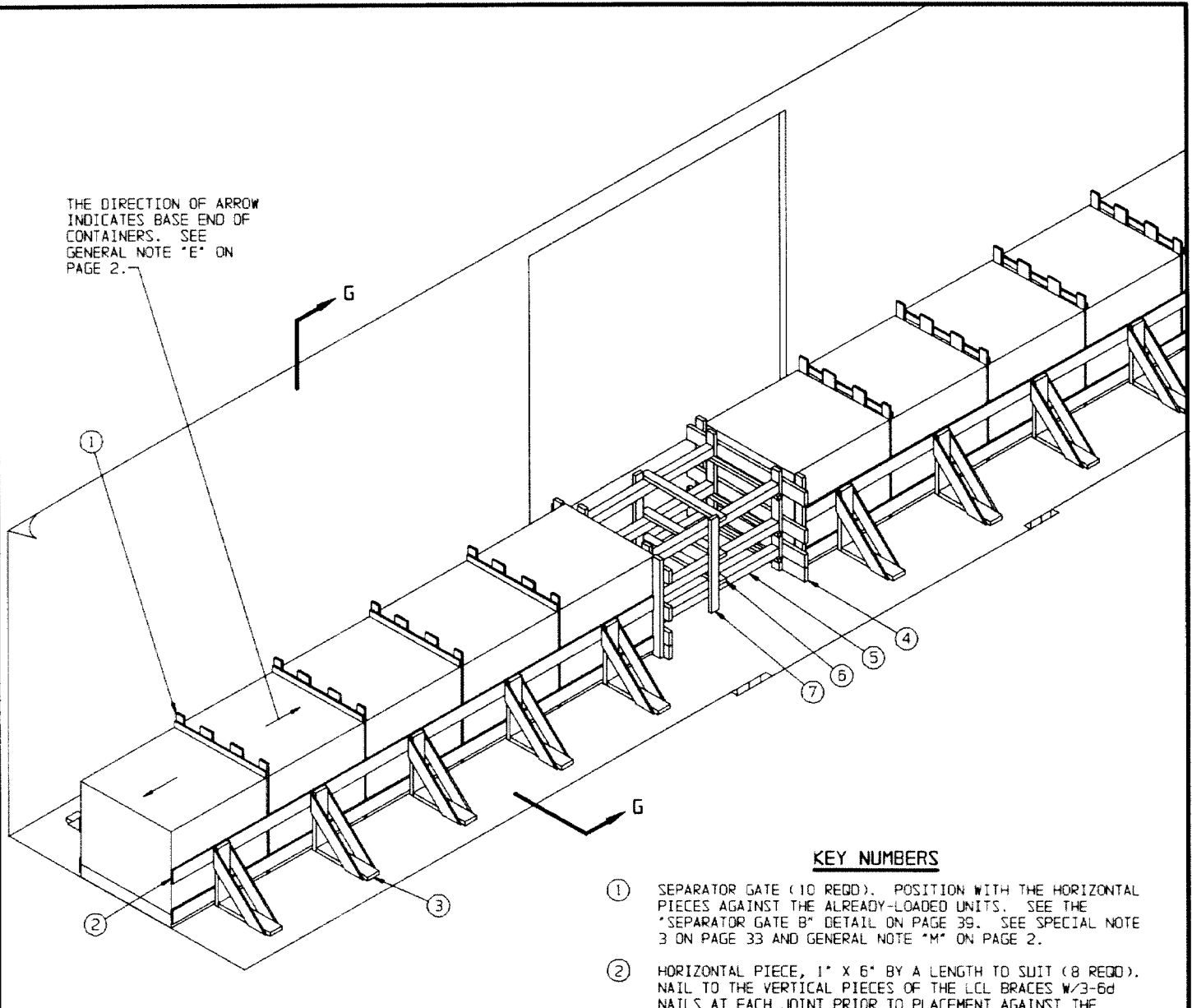


BRACE

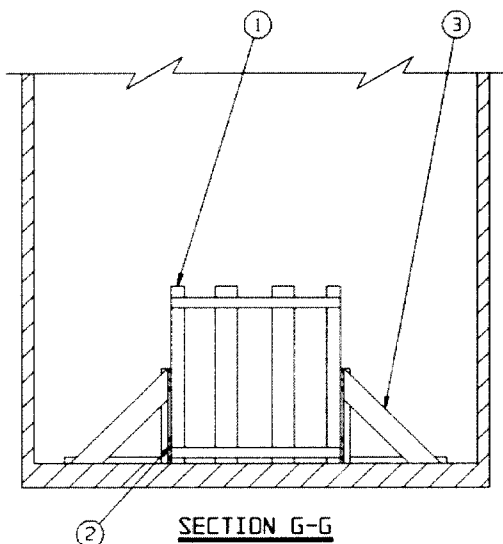
4" X 4" MATERIAL

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

THE DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS. SEE GENERAL NOTE "E" ON PAGE 2.



ISOMETRIC VIEW



SECTION G-G

KEY NUMBERS

- ① SEPARATOR GATE (10 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 39. SEE SPECIAL NOTE 3 ON PAGE 33 AND GENERAL NOTE "M" 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 34 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE (24 REQD). SEE THE DETAIL ON PAGE 34 AND SPECIAL NOTE 4 ON PAGE 33. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "R" ON PAGE 3.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 33. SEE SPECIAL NOTES 2 AND 3 ON PAGE 33.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 58") (6 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "L" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3. SEE SPECIAL NOTES 2 AND 3 ON PAGE 33.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" X 36" (3 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤, W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "T" ON PAGE 3.
- ⑦ VERTICAL STRUT BRACING, 2" X 4" X 38" (2 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤, W/3-10d NAILS AT EACH JOINT.

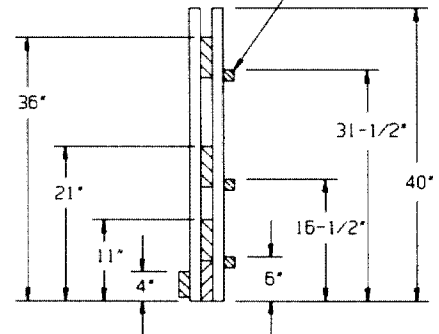
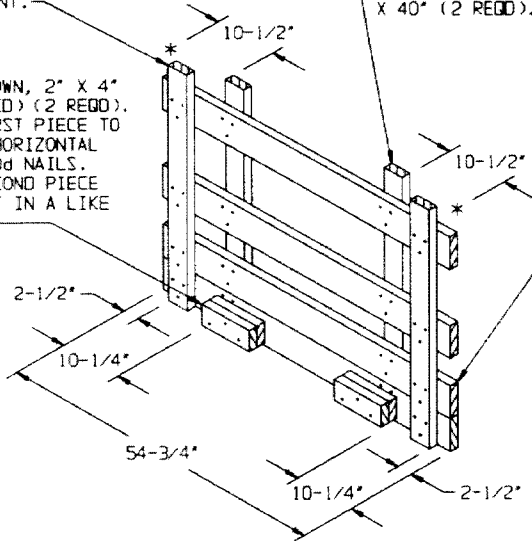
GATE RETAINER, 2" X 4" X 40"
(2 REQD). NAIL TO THE HORIZONTAL
PIECES W/3-10d NAILS
AT EACH JOINT.

GATE HOLD-DOWN, 2" X 4"
X 9" (DOUBLED) (2 REQD).
NAIL THE FIRST PIECE TO
THE BOTTOM HORIZONTAL
PIECE W/3-10d NAILS.
NAIL THE SECOND PIECE
TO THE FIRST IN A LIKE
MANNER.

VERTICAL PIECE, 2" X 4"
X 40" (2 REQD).

STRUT LEDGER, 2" X 2" OR
2" X 4" X 36" (3 REQD).
NAIL TO THE VERTICAL
PIECES W/2-10d NAILS AT
EACH JOINT.

HORIZONTAL PIECE, 2" X 6" X
54-3/4" (4 REQD). NAIL TO
THE VERTICAL PIECES W/3-10d
NAILS AT EACH JOINT.



END VIEW

CENTER GATE C

FOR A 1-WIDE CONTAINERS-LENGTHWISE
LOAD ON PAGE 36.

SPECIAL NOTES:

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

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	70	18
1" X 4"	75	25
1" X 6"	323	162
2" X 2"	18	6
2" X 4"	35	24
2" X 6"	146	146
4" X 4"	29	39
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/4
10d (3")	288	3
12d (3-1/4")	204	3-1/4
16d (3-1/2")	72	1-1/4

LOAD AS SHOWN

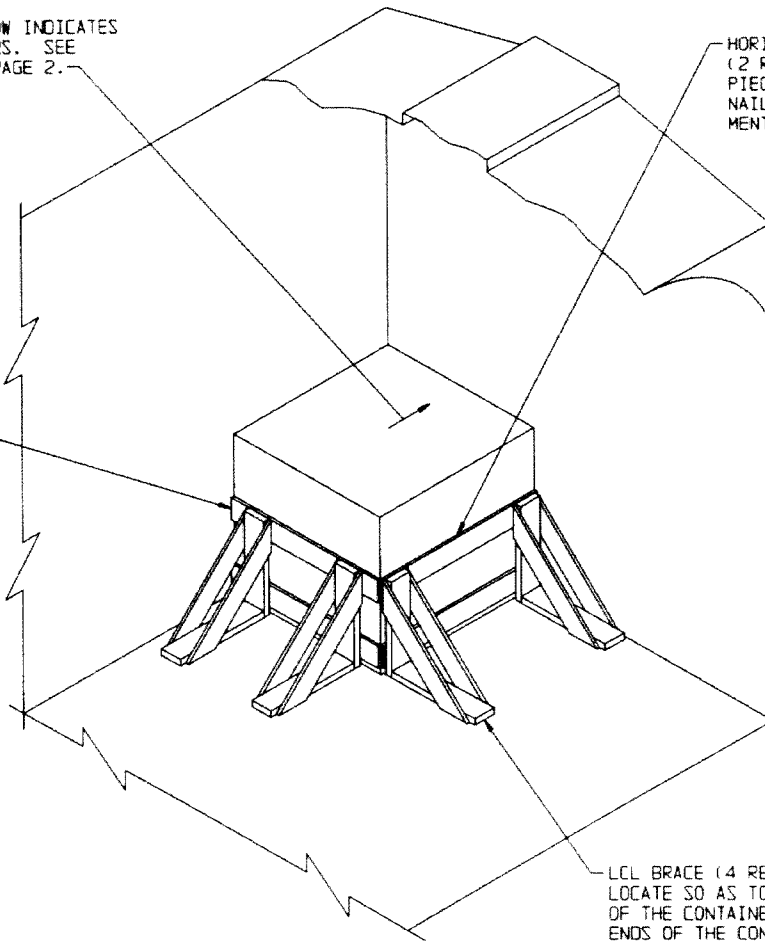
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	22,596 LBS
DUNNAGE		852 LBS
TOTAL WEIGHT		23,448 LBS (APPROX)

THE DIRECTION OF ARROW INDICATES
BASE END OF CONTAINERS. SEE
GENERAL NOTE "E" ON PAGE 2.

HORIZONTAL PIECE, 1" X 6" X 44-1/2"
(2 RECD). NAIL TO THE VERTICAL
PIECES OF THE LCL BRACES W/3-6d
NAILS AT EACH JOINT PRIOR TO PLACE-
MENT AGAINST LADING.

HORIZONTAL PIECE, 1" X 6"
X 42" (2 RECD). NAIL TO
THE VERTICAL PIECES OF THE
LCL BRACES W/3-6d NAILS AT
EACH JOINT PRIOR TO PLACE-
MENT AGAINST LADING.

SEE GENERAL NOTE "G"
ON PAGE 2.



LCL BRACE (4 RECD). SEE THE DETAIL BELOW.
LOCATE SO AS TO BE CENTERED ON THE JOINTS
OF THE CONTAINER ENDS AND/OR AGAINST THE
ENDS OF THE CONTAINER WIDTH. NAIL TO THE
CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE
"M" ON PAGE 2 AND GENERAL NOTE "R" ON PAGE 3.

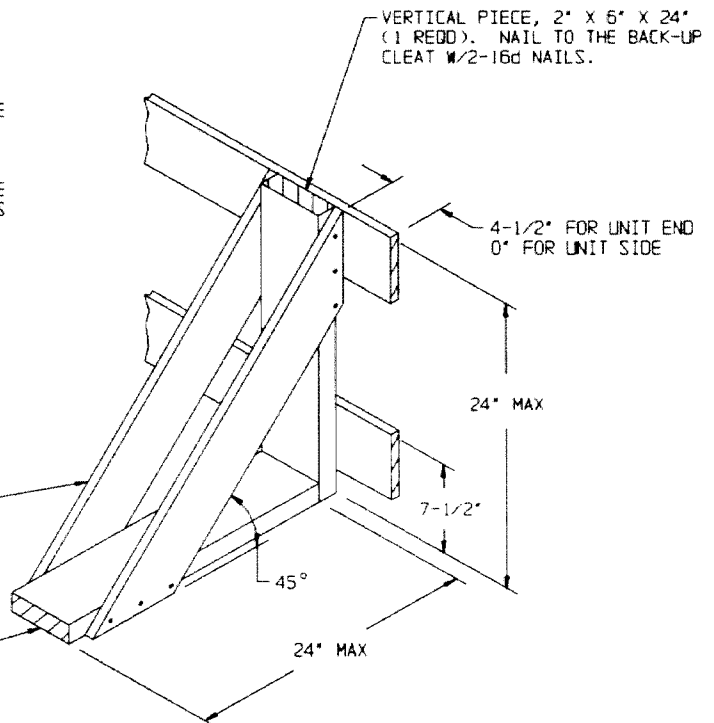
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND GENERAL NOTE "R" ON PAGE 3.
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3.
3. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING. BRACES MAY BE ADDED FOR LONGITUDINAL BRACING AS NECESSARY.

ANGLE BRACE, 1" X 6" BY CUT TO FIT
(2 RECD). NAIL TO THE VERTICAL
PIECE AND TO THE BACK-UP CLEAT
W/3-6d NAILS AT EACH END.

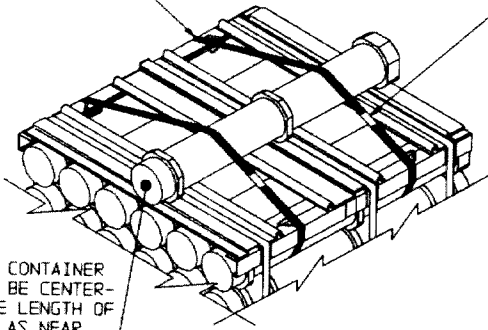
BACK-UP CLEAT,
2" X 6" MATERIAL
(1 RECD).



LCL BRACE

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 13'-0" LONG STEEL STRAPPING (2 REQD).

SEAL FOR 1-1/4" STRAP (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.



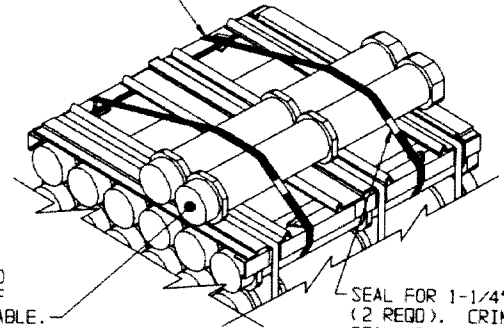
POSITION CONTAINER SO AS TO BE CENTERED ON THE LENGTH OF THE UNIT AS NEAR AS PRACTICABLE.

SECUREMENT OF ONE CONTAINER

SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT WITHIN A LAYER AS SHOWN ON PAGE 36.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS OF CONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION WOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED.
4. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 14'-0" LONG STEEL STRAPPING (2 REQD).

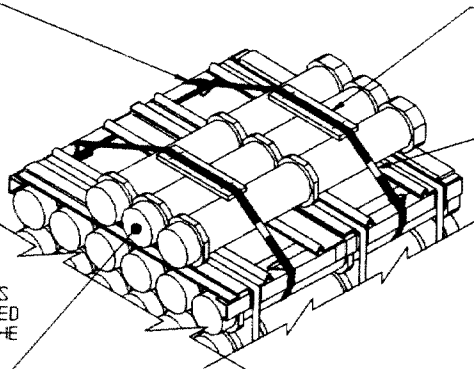


POSITION CONTAINERS SO AS TO BE CENTERED ON THE LENGTH OF THE UNIT AS NEAR AS PRACTICABLE.

SEAL FOR 1-1/4" STRAP (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

SECUREMENT OF TWO CONTAINERS

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 15'-0" LONG STEEL STRAPPING (2 REQD). STAPLE TO THE STRAPPING BOARD W/2 STAPLES.



POSITION CONTAINERS SO AS TO BE CENTERED ON THE LENGTH OF THE UNIT AS NEAR AS PRACTICABLE.

STRAPPING BOARD, 1" X 4" X 12" FOR 3 CONTAINERS, 19" FOR 4 CONTAINERS, 26" FOR 5 CONTAINERS (2 REQD).

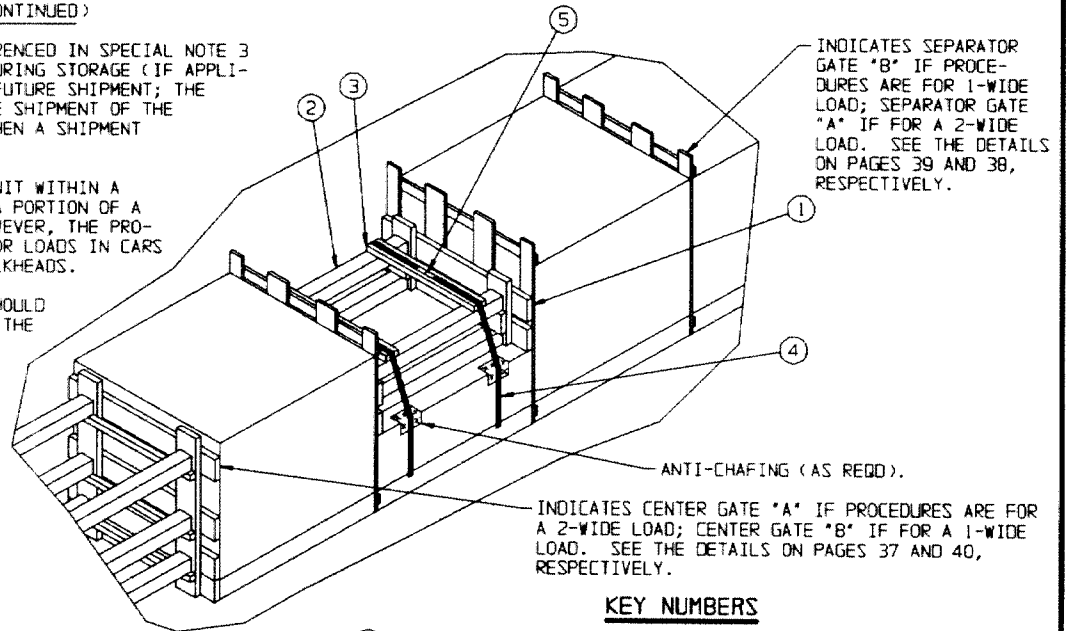
SEAL FOR 1-1/4" STRAP (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

SECUREMENT OF THREE CONTAINERS

PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS

(SPECIAL NOTES CONTINUED)

4. THE FILLER CONTAINERS AS REFERENCED IN SPECIAL NOTE 3 SHOULD REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT; THE DUNNAGE DEPICTED BELOW FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES ITS DESTINATION.
5. THE "POSITIONING OF PARTIAL UNIT WITHIN A LAYER" VIEW AT RIGHT DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.



POSITIONING OF PARTIAL UNIT WITHIN A LAYER

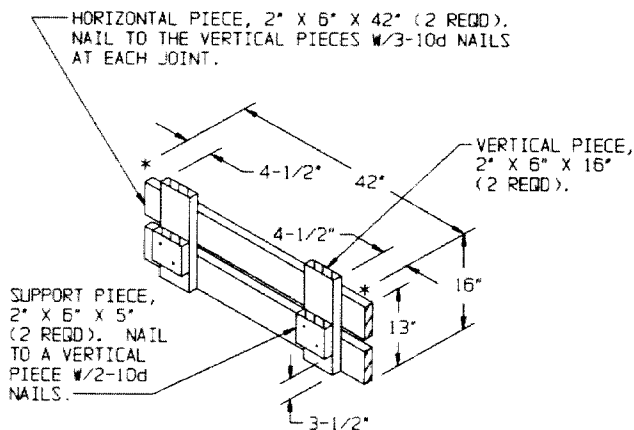
SPECIAL NOTES:

1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A 1-LAYER LOAD. THE PRINCIPLES MAY BE APPLIED FOR SHIPMENT OF A PARTIAL PALLET UNIT IN THE SECOND LAYER.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER WILL BE LIMITED TO NOT LESS THAN TWO (2) LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 2-LAYER UNIT WITHIN A LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT 3 AND 4-LAYER PARTIAL UNITS. PARTIAL-UNIT GATE DETAILS ARE SHOWN FOR UNITS REDUCED BY ONE, TWO AND THREE LAYERS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) FULL CONTAINERS, OR ELSE EMPTY OR REJECT Pallet CONTAINERS WILL BE USED AS FILLER CONTAINERS, AS NECESSARY TO COMPLETE A LAYER ON THE UNIT. POSITION EMPTY OR REJECT CONTAINERS IN THE MIDDLE OF THE TOP LAYER; MARK AS SPECIFIED WITHIN MIL-STD-129.

(CONTINUED ABOVE)

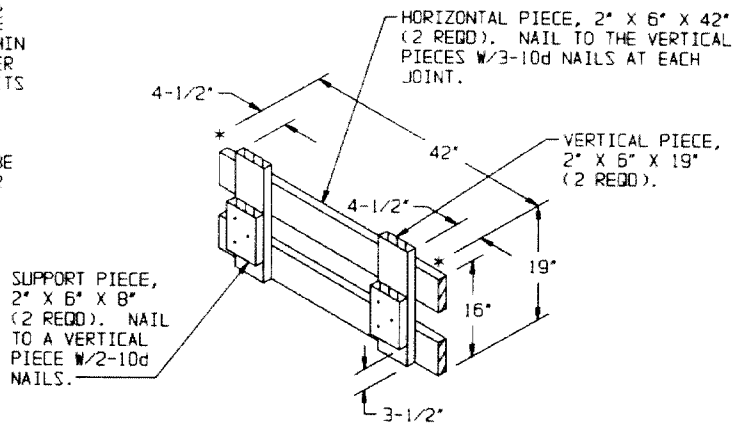
KEY NUMBERS

- ① PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 2 AT LEFT.
- ② STRUT, 4" X 4" X 38-1/2" (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" X 27-1/2" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- ④ UNITIZING STRAP, 1-1/4" X .031" OR .035" X 16'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION UNDER THE PALLET.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.



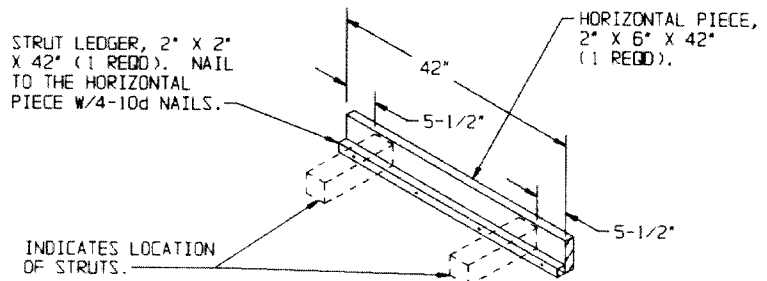
PARTIAL-UNIT GATE A

FOR 3 CONTAINERS HIGH PARTIAL UNIT.



PARTIAL-UNIT GATE B

FOR 2 CONTAINERS HIGH PARTIAL UNIT.



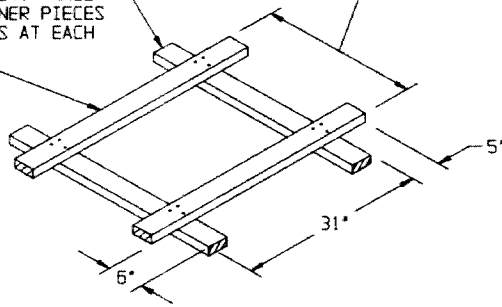
PARTIAL-UNIT GATE C

FOR 4 CONTAINERS HIGH PARTIAL UNIT.

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

BUFFER PIECE, 2" X 4" X 41" (2 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT PALLET.

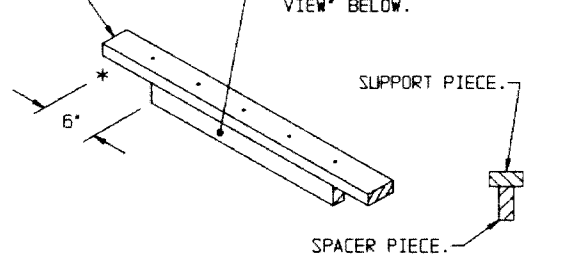


ANTI-SWAY BRACE

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

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/5-12d NAILS.

SPACER PIECE, 2" X 4" BY CUT TO FIT BETWEEN LATERALLY ADJACENT PALLET UNITS MINUS 1/4" (1 REQD). POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE. SEE THE "END VIEW" BELOW.



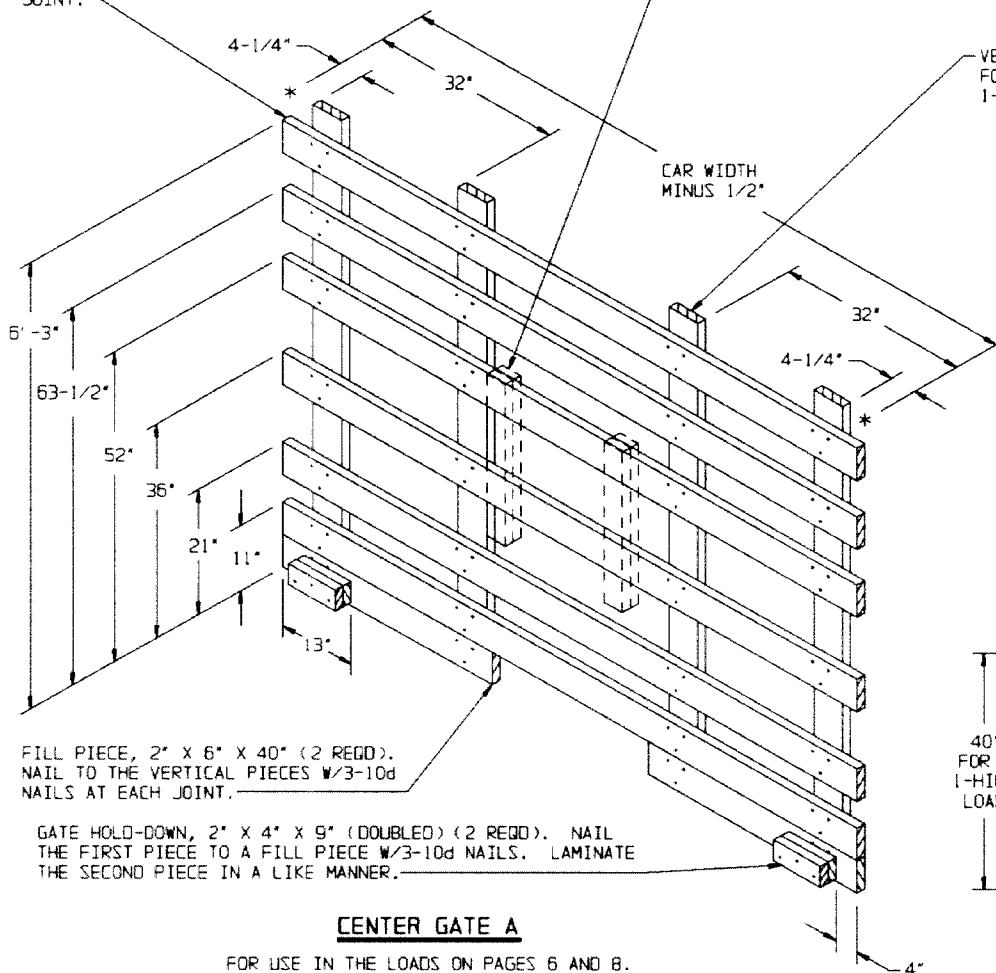
END VIEW

TOP-OF-LOAD ANTI-SWAY BRACE

HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (6 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

STOP PIECE, 2" X 4" X 27" (DOUBLED) (2 REQD). POSITION SO AS TO BE IN CONTACT WITH THE PALLET UNITS AND NAIL THE FIRST PIECE TO THE HORIZONTAL PIECES W/3-10d NAILS AT EACH JOINT. LAMINATE THE SECOND PIECE TO THE FIRST W/5-10d NAILS. SEE SPECIAL NOTE 8 ON PAGE 7.

VERTICAL PIECE, 2" X 6" X 6'-7" FOR A 2-HIGH LOAD, 40" FOR A 1-HIGH LOAD (4 REQD).



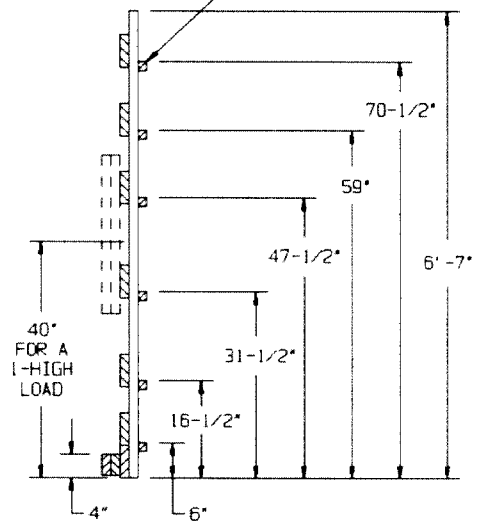
FILL PIECE, 2" X 6" X 40" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

GATE HOLD-DOWN, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO A FILL PIECE W/3-10d NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.

CENTER GATE A

FOR USE IN THE LOADS ON PAGES 6 AND 8.

STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 6" IN LENGTH (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



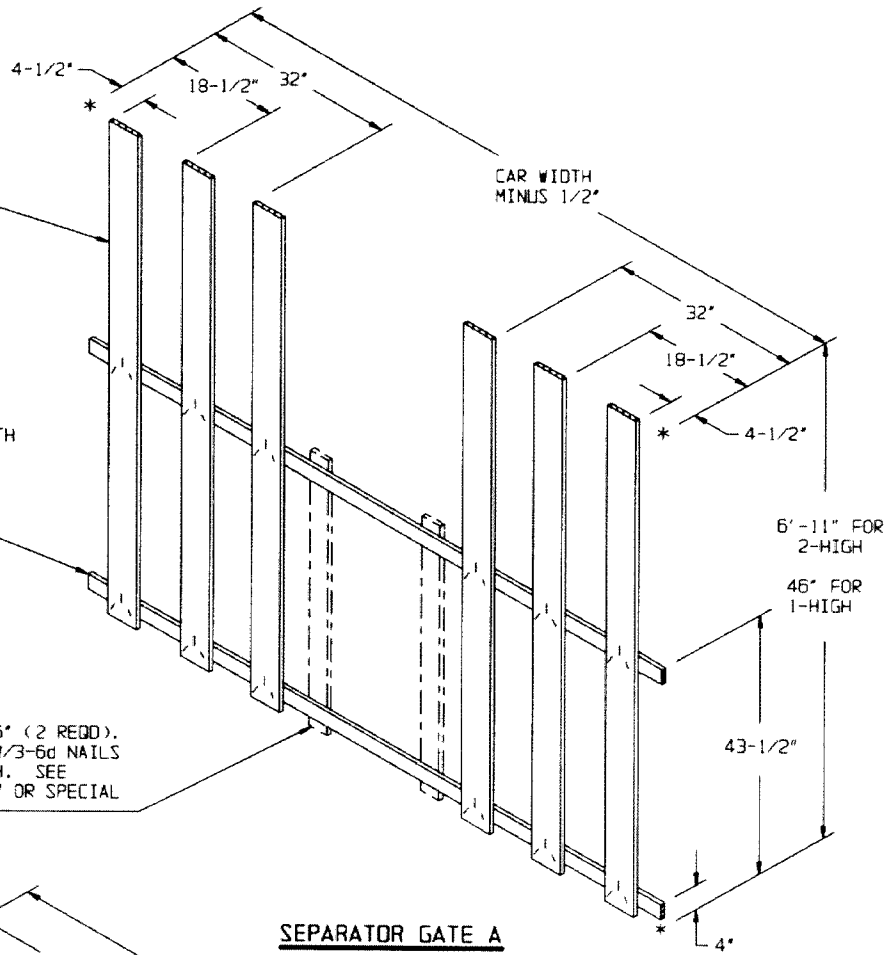
END VIEW

DETAILS

VERTICAL PIECE, 1" X 6" X 6'-11"
FOR A 2-HIGH LOAD, 46" FOR A
1-HIGH LOAD (6 REQD).

HORIZONTAL PIECE, 1" X 3" BY CAR WIDTH
MINUS 1/2" IN LENGTH (2 REQD). NAIL
TO THE VERTICAL PIECES W/3-6d NAILS
AT EACH JOINT AND CLINCH.

STOP PIECE, 1" X 4" X 46" (2 REQD).
NAIL TO THE TIE PIECES W/3-6d NAILS
AT EACH JOINT AND CLINCH. SEE
SPECIAL NOTE 6 ON PAGE 7 OR SPECIAL
NOTE 6 ON PAGE 9.



SEPARATOR GATE A

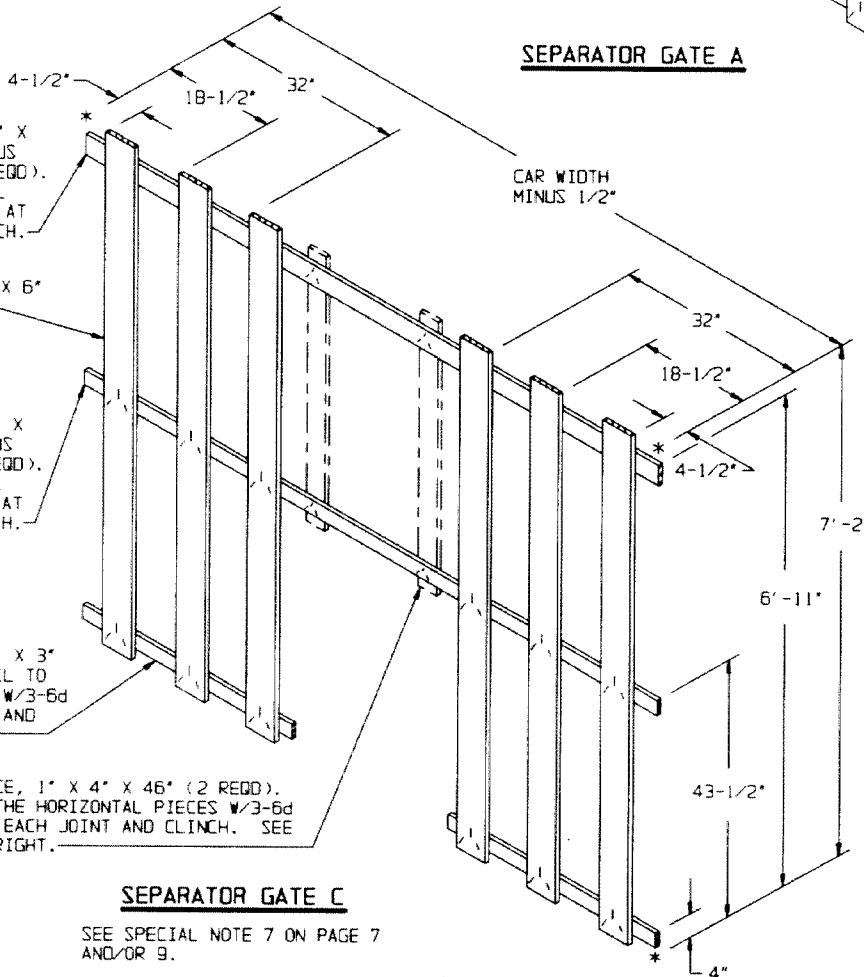
HORIZONTAL PIECE, 1" X 4"
BY CAR WIDTH MINUS
1/2" IN LENGTH (1 REQD).
NAIL TO THE VERTICAL
PIECES W/3-6d NAILS AT
EACH JOINT AND CLINCH.

VERTICAL PIECE, 1" X 6"
X 7'-2" (6 REQD).

HORIZONTAL PIECE, 1" X 3"
BY CAR WIDTH MINUS
1/2" IN LENGTH (1 REQD).
NAIL TO THE VERTICAL
PIECES W/3-6d NAILS AT
EACH JOINT AND CLINCH.

HORIZONTAL PIECE, 1" X 3"
X 40" (2 REQD). NAIL TO
THE VERTICAL PIECES W/3-6d
NAILS AT EACH JOINT AND
CLINCH.

STOP PIECE, 1" X 4" X 46" (2 REQD).
NAIL TO THE HORIZONTAL PIECES W/3-6d
NAILS AT EACH JOINT AND CLINCH. SEE
NOTE AT RIGHT.



NOTE: THE STOP PIECES
INDICATED BY THE DOTTED
LINES ON THE SEPARATOR
GATE ARE ONLY REQUIRED
IN CARS EQUIPPED WITH
SLIDING DOORS.

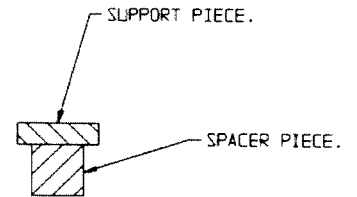
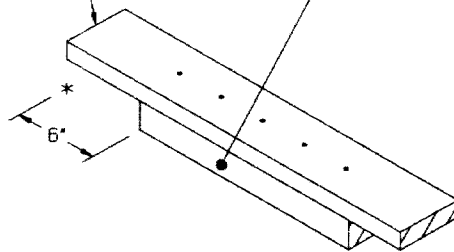
SEPARATOR GATE C

SEE SPECIAL NOTE 7 ON PAGE 7
AND/OR 9.

DETAILS

SUPPORT PIECE, 2" X 6" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/5-12d NAILS.

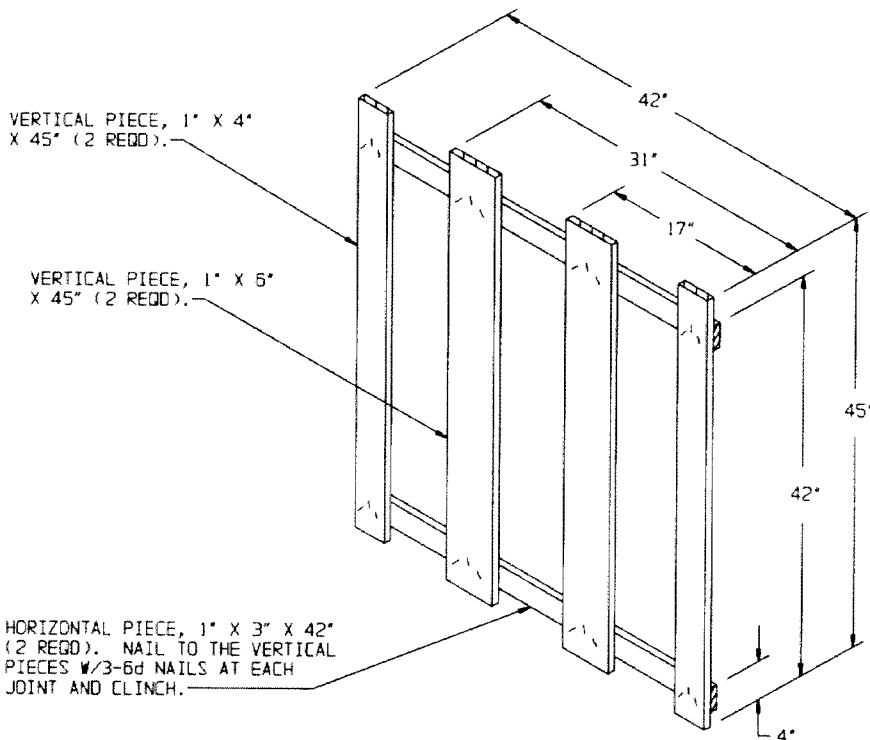
SPACER PIECE, 4" X 4" BY CUT TO FIT BETWEEN LATERALLY ADJACENT PALLET UNITS MINUS 1/4" (1 REQD). POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE. SEE THE "END VIEW" BELOW.



SPACER ASSEMBLY B

END VIEW

THIS ASSEMBLY IS FOR USE UNDER A DOORWAY PROTECTION STRAP WHICH IS INSTALLED AROUND PALLET UNITS OF CONTAINERS IN THE DOORWAY AREA OF A LOAD. SEE THE "ALTERNATIVE DOORWAY PROTECTION D" DETAIL ON PAGE 49 FOR A TYPICAL INSTALLATION.



VERTICAL PIECE, 1" X 4" X 45" (2 REQD).

VERTICAL PIECE, 1" X 6" X 45" (2 REQD).

HORIZONTAL PIECE, 1" X 3" X 42" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH.

SEPARATOR GATE B

THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 12, 30 AND 32.

DETAILS

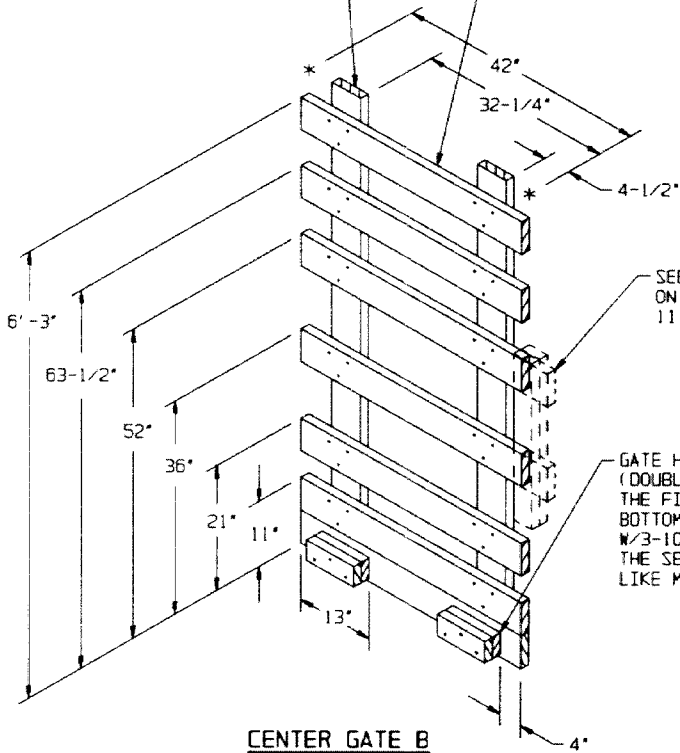
VERTICAL PIECE, 2" X 6"
X 6'-7" (2 REQD).

HORIZONTAL PIECE, 2" X 6"
X 42" (7 REQD). NAIL TO
THE VERTICAL PIECES
W/3-10d NAILS AT EACH
JOINT.

STRUT LEDGER, 2" X 2" OR
2" X 4" X 39" (6 REQD).
NAIL TO THE VERTICAL
PIECES W/2-10d NAILS AT
EACH JOINT.

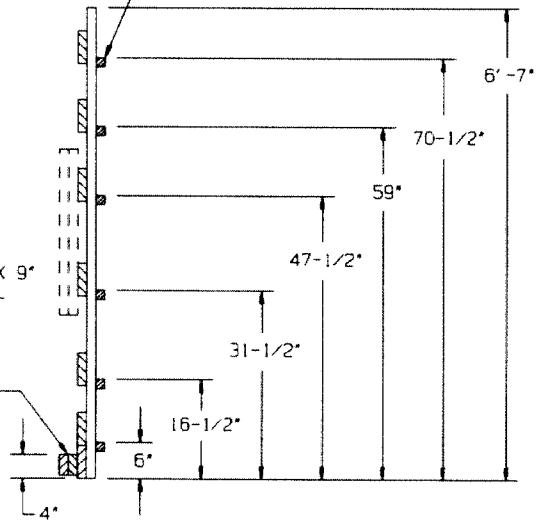
SEE SPECIAL NOTE 11
ON PAGE 7 OR NOTE
11 ON PAGE 9.

GATE HOLD-DOWN, 2" X 4" X 9"
(DOUBLED) (2 REQD). NAIL
THE FIRST PIECE TO THE
BOTTOM HORIZONTAL PIECE
W/3-10d NAILS. LAMINATE
THE SECOND PIECE IN A
LIKE MANNER.

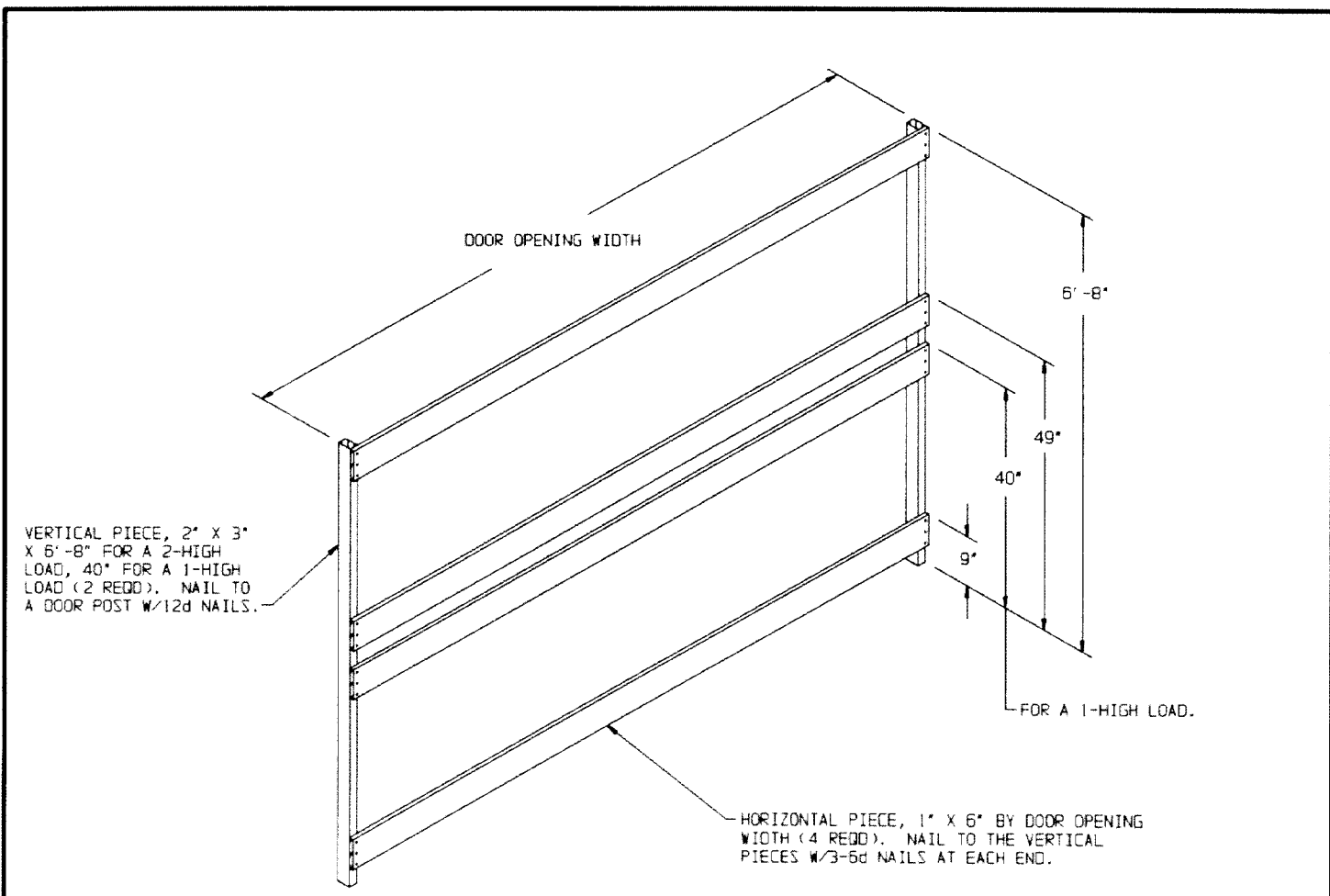


CENTER GATE B

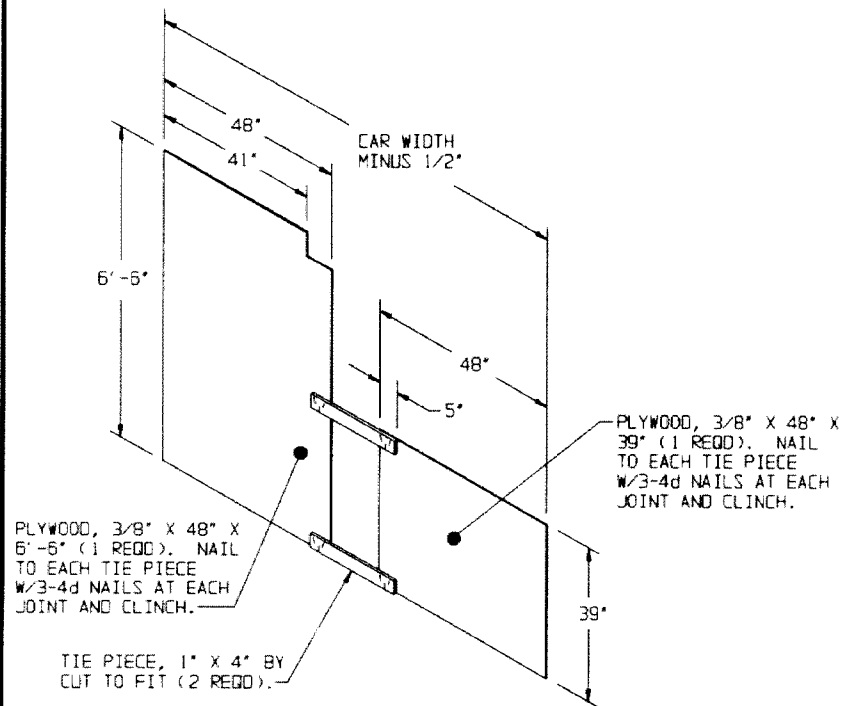
SEE SPECIAL NOTE 10 ON
PAGE 7 AND/OR 9.



END VIEW

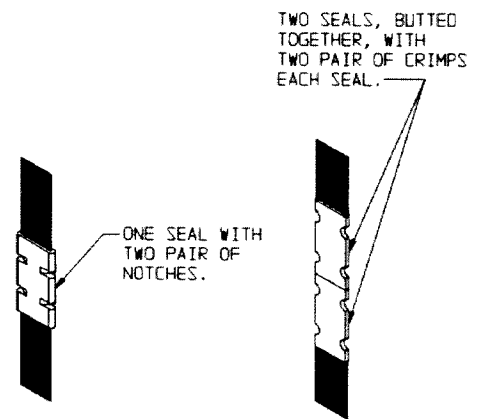


DOORWAY PROTECTION



SEPARATOR GATE D

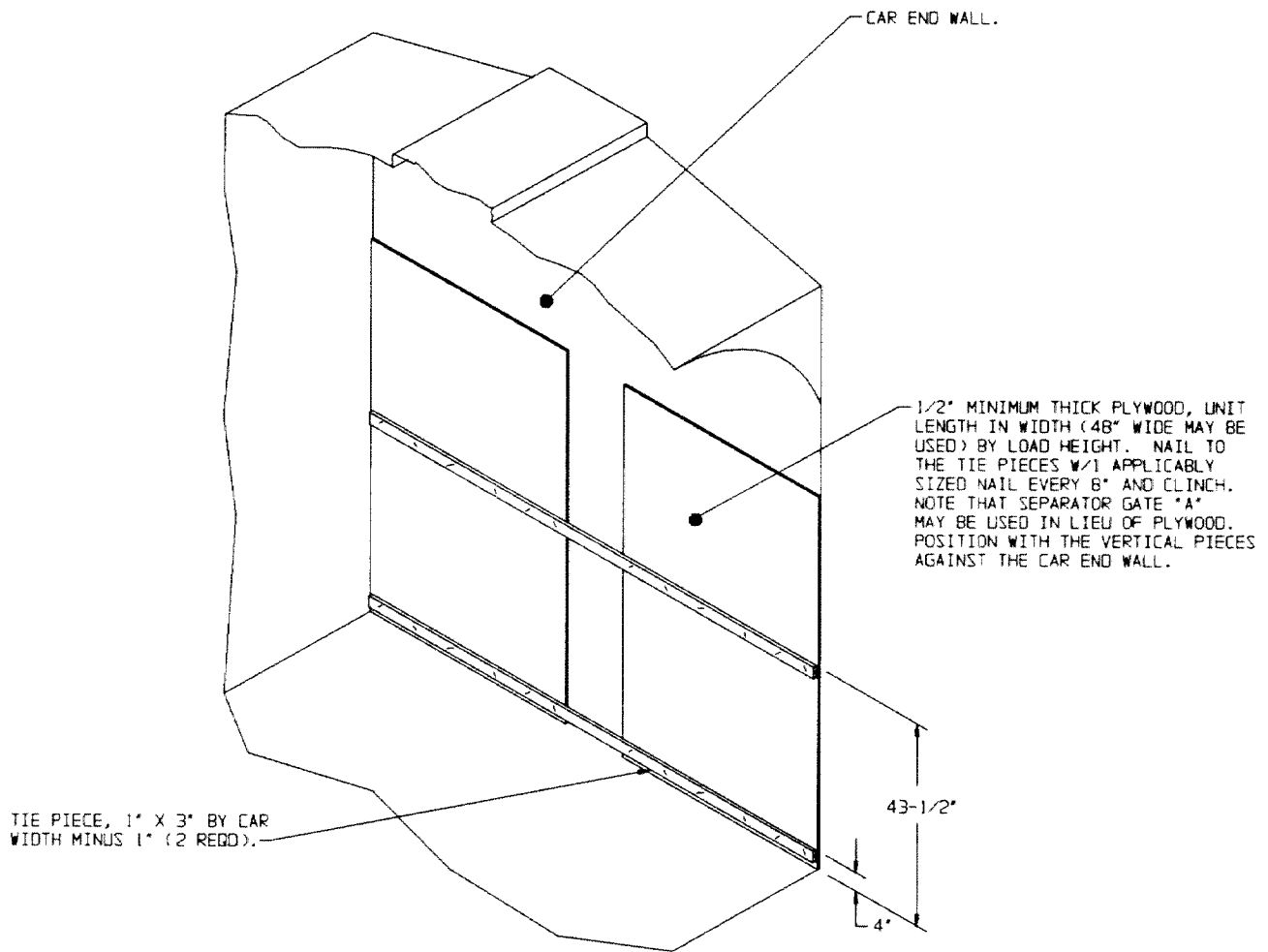
THIS ASSEMBLY IS FOR USE IN THE OMITTED PALLET UNIT PROCEDURES SHOWN ON PAGE 18.



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

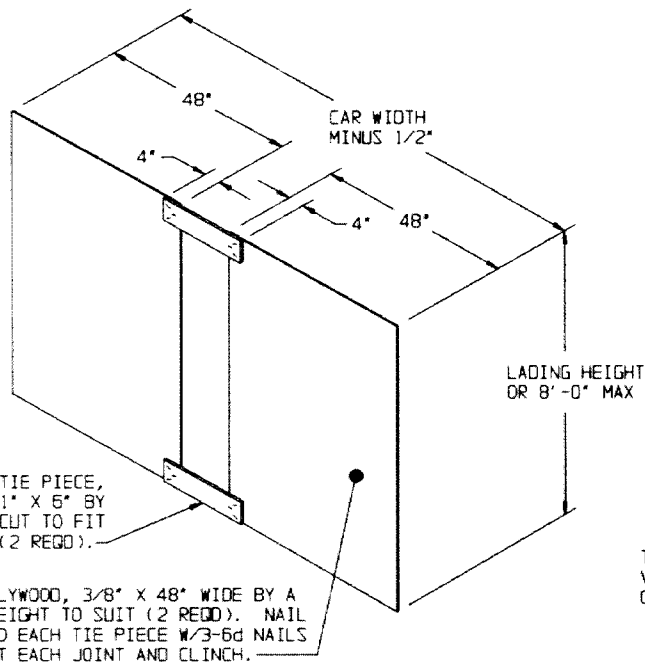
STRAP JOINT B
METHOD OF SECURING A STRAP JOINT WHEN USING A CRIMP-TYPE SEALER.

DETAILS



END-WALL LINING

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



NOTE ▲:

THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LIEU OF THE SEPARATOR GATE SHOWN WITHIN A LOAD, WHICH IS FABRICATED FROM 1" X 3" AND 1" X 6" MATERIAL. THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LOADS WHICH ARE EITHER ONE OR TWO PALLET UNITS IN HEIGHT.

NOTE ○:

IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES 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). 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 37, IS SHOWN AS TYPICAL.

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

TIE PIECE, 1" X 6" BY CUT TO FIT (2 REQD).
 PLYWOOD, 3/8" X 48" WIDE BY A HEIGHT TO SUIT (2 REQD). NAIL TO EACH TIE PIECE W/3-6d NAILS AT EACH JOINT AND CLINCH.

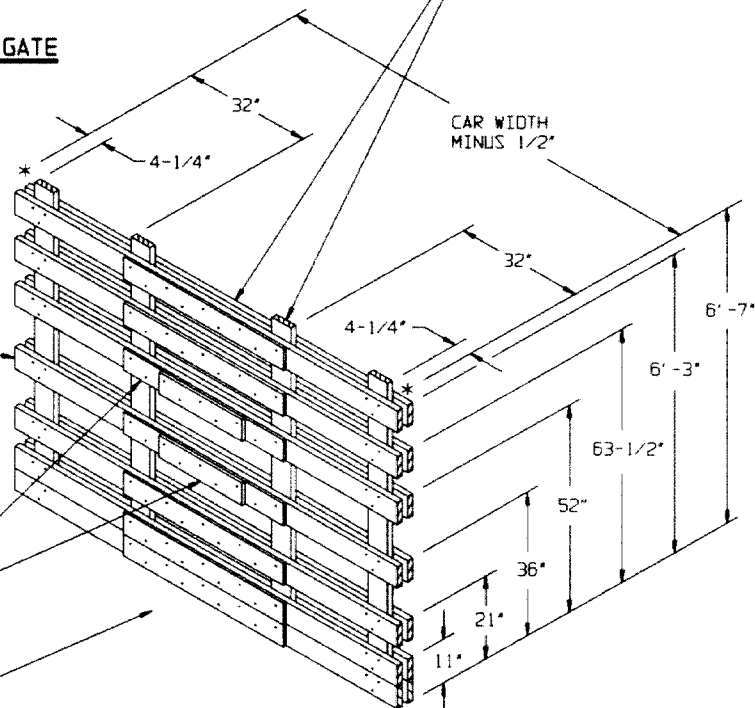
ALTERNATIVE SEPARATOR GATE

SEE "NOTE ▲" ABOVE.

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.

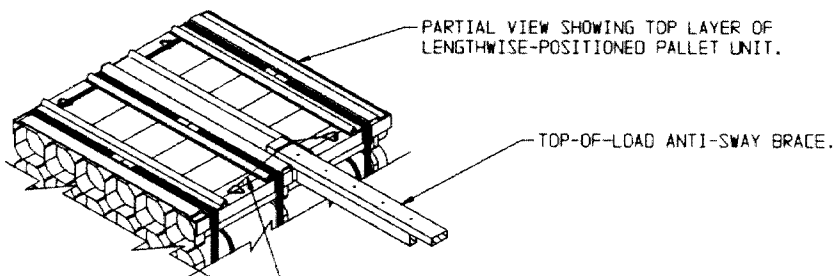
SHIM MATERIAL, 6" WIDE PLYWOOD OR DIMENSIONAL LUMBER OF A THICKNESS AND LENGTH AS REQUIRED TO FILL THE VOID BETWEEN THE CAR END WALL AND THE BULKHEAD. NAIL TO THE FILLER PIECE AND/OR LAMINATE W/1 APPLICABLY SIZED NAIL EVERY 6".

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.



END-OF-CAR-BULKHEAD

SEE "NOTE ○" ABOVE.

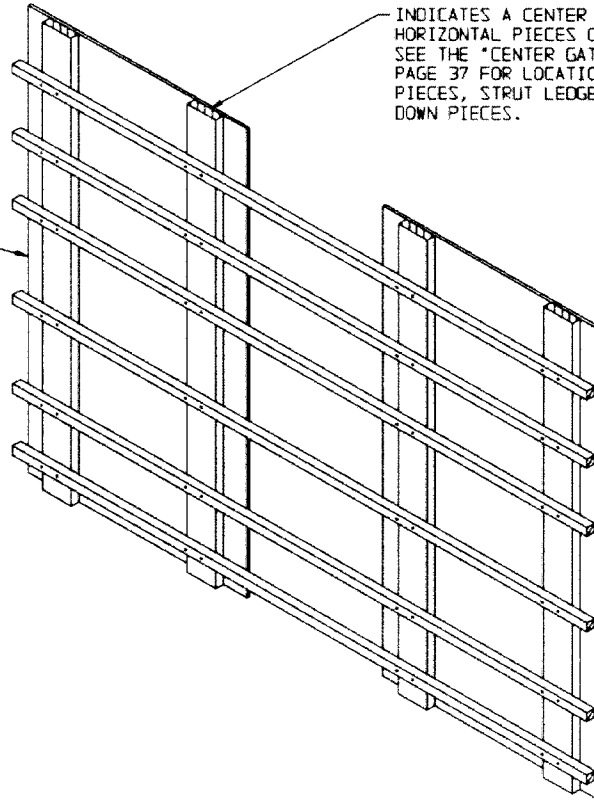


TIE WIRE APPLICATION

NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND TOP-OF-LOAD ANTI-SWAY BRACE SUPPORT PIECE AND TWIST TO PREVENT DISPLACEMENT. THREAD EACH END OF WIRE THRU A LIFTING RING ON THE PALLET COVER AND TWIST.

DETAILS

PLYWOOD, 1/2" THICK BY THE UNIT WIDTH BY THE LOAD HEIGHT (2 RECD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6". PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT WIDTH OR HEIGHT IF DESIRED.

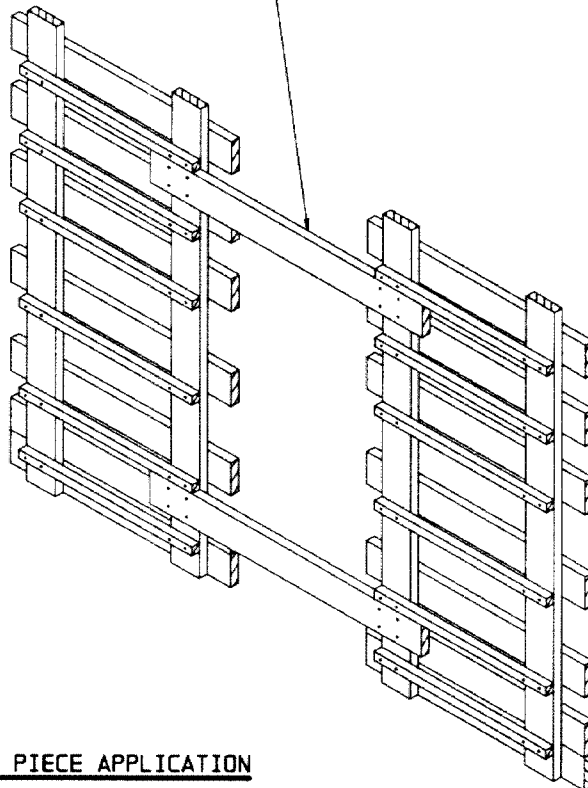


INDICATES A CENTER GATE "A" WITH THE HORIZONTAL PIECES OMITTED (1 RECD). SEE THE "CENTER GATE A" DETAIL ON PAGE 37 FOR LOCATION OF THE VERTICAL PIECES, STRUT LEDGERS, AND GATE HOLD-DOWN PIECES.

TIE PIECE, 2" x 6" BY A LENGTH TO SUIT (2 RECD). 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

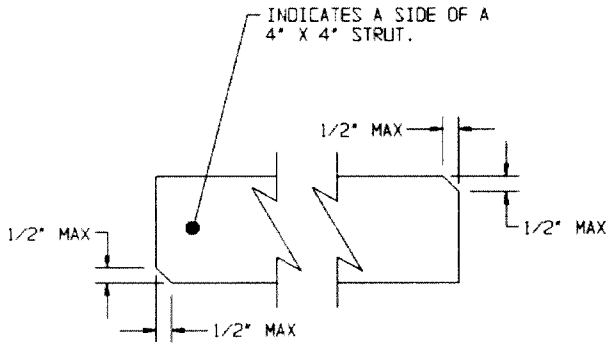
CENTER GATE "A" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW.



INDICATES A TYPICAL "SPLIT" CENTER GATE (2 RECD). SEE THE "CENTER GATE B" DETAIL ON PAGE 40.

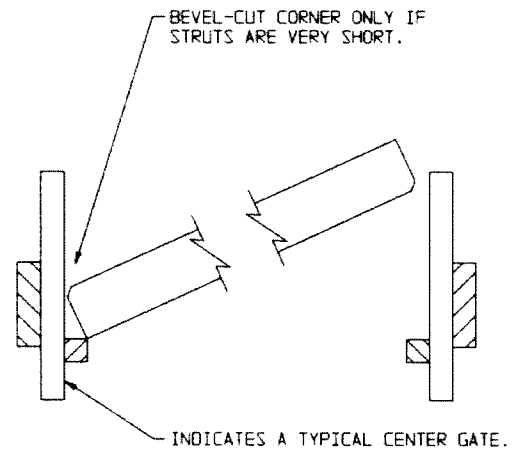
TIE PIECE APPLICATION

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



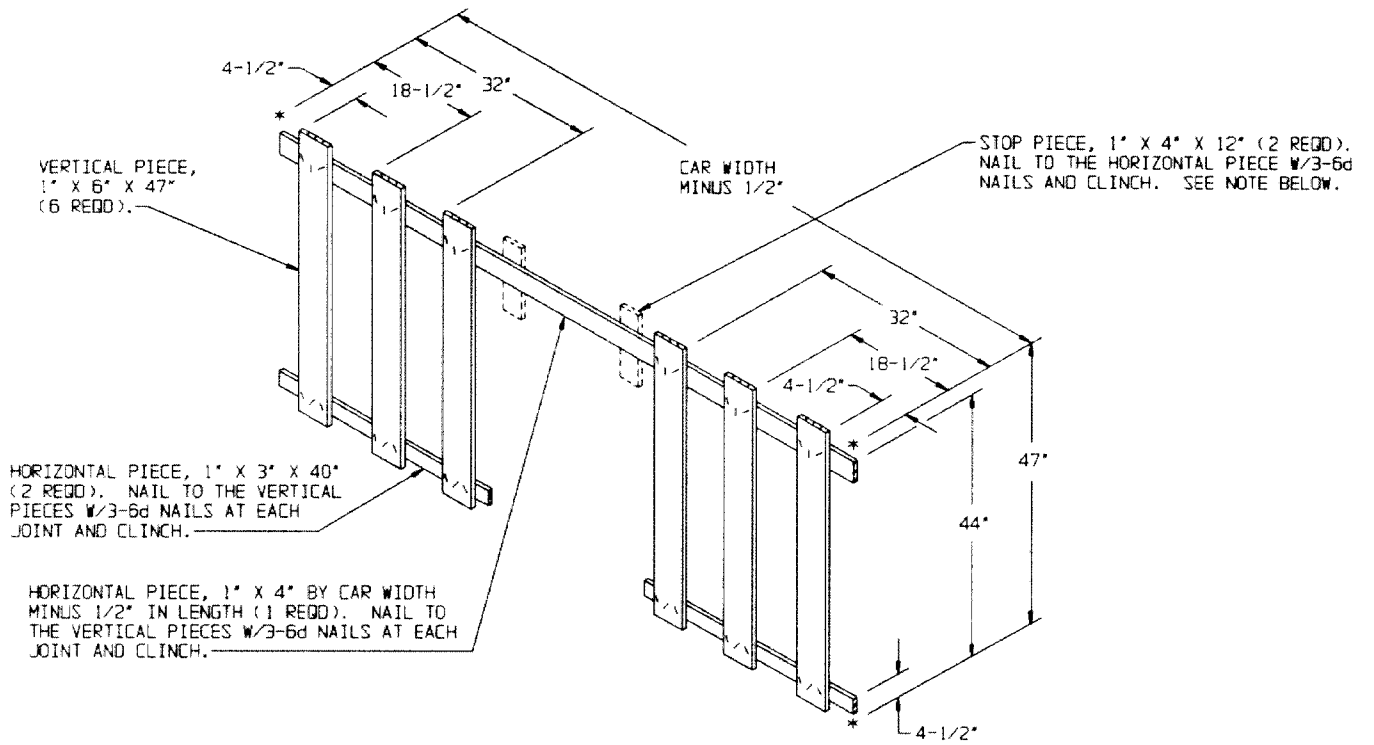
BEVEL-CUT

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

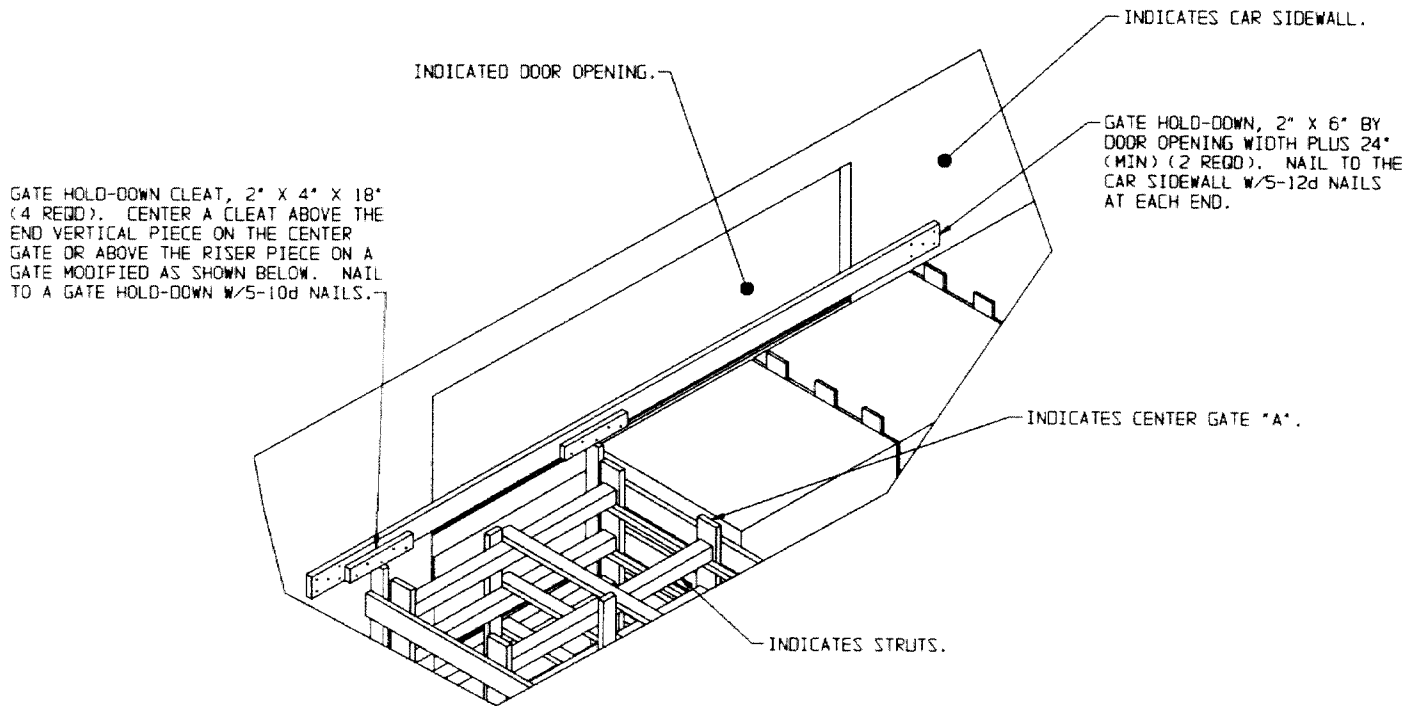
SEE GENERAL NOTE "U" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



SEPARATOR GATE E

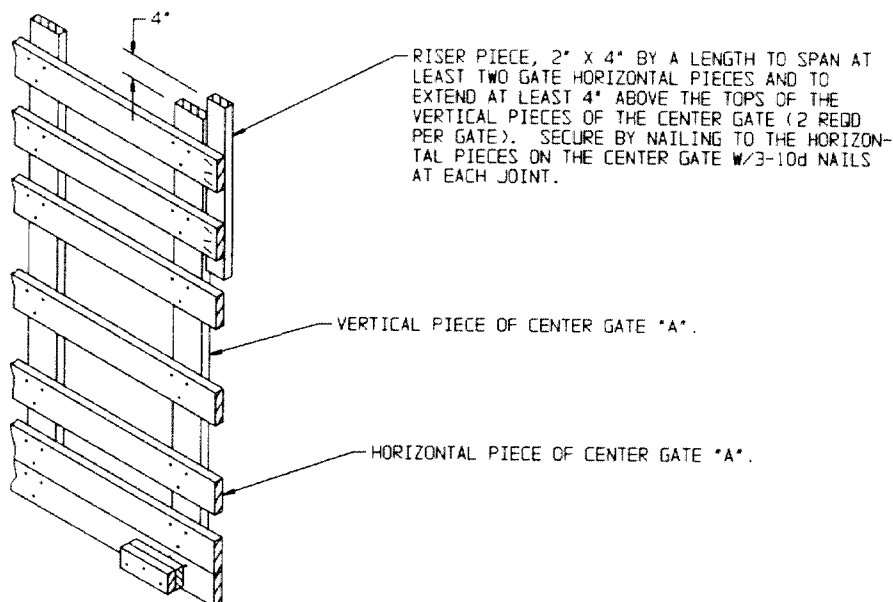
SEE SPECIAL NOTE 7 ON PAGE 7 AND/OR 9.

NOTE: THE STOP PIECES INDICATED BY THE DOTTED LINES ON THE SEPARATOR GATE ARE ONLY REQUIRED IN CARS EQUIPPED WITH SLIDING DOORS.



ALTERNATIVE GATE HOLD-DOWN

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



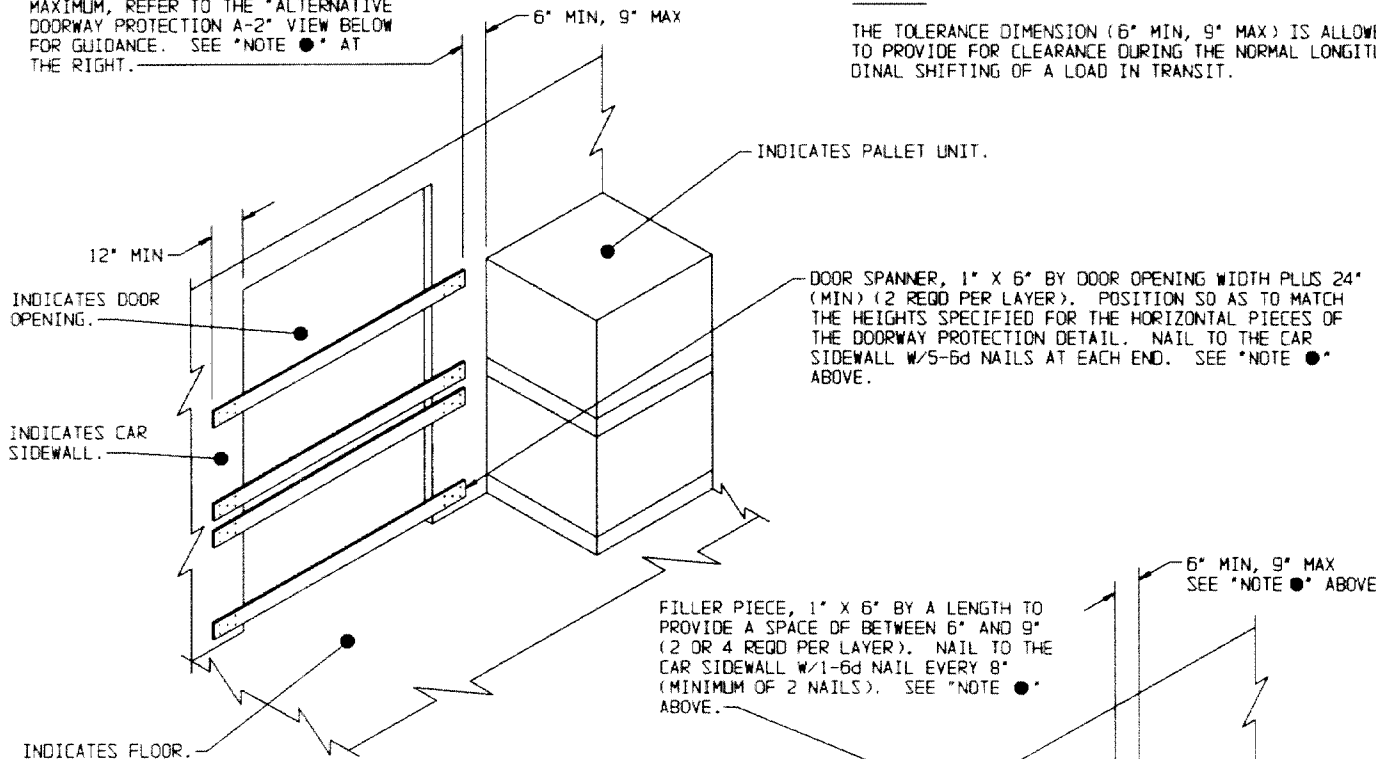
CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THIS VIEW ARE APPLICABLE FOR CENTER GATE "A". THE RISER PIECE WILL PROVIDE A MEANS FOR THE GATE TO CONTACT GATE HOLD-DOWN AS SHOWN IN THE "ALTERNATIVE GATE HOLD-DOWN" DETAIL AT THE TOP OF THIS PAGE.

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

NOTE ●:

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

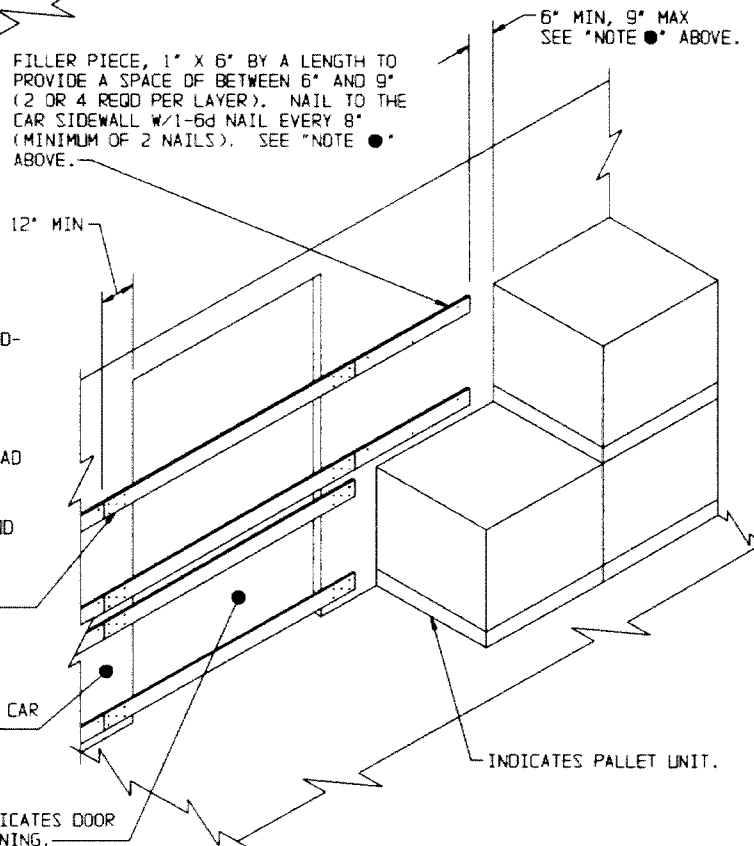
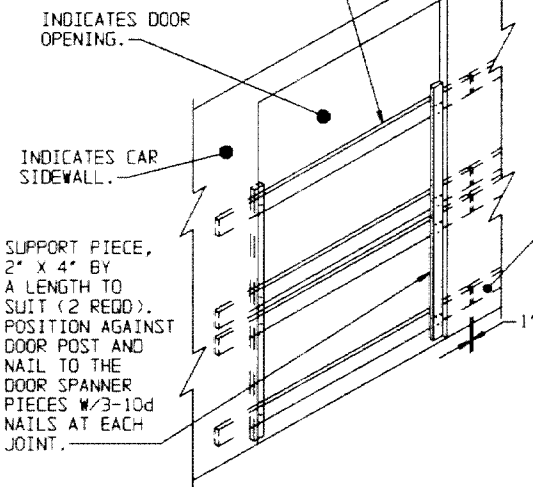


ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR. THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED BY THE "ALTERNATIVE DOORWAY PROTECTION D" DETAIL ON PAGE 49 OR IN THE LOAD AS SHOWN ON PAGE 14 MAY BE USED ON THE LOADING SIDE.

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.

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 DOORWAY PROTECTION DETAIL. 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 "A-1" PROCEDURES.

INDICATES 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 SPANNER AND/OR FILLER PIECES ON THE OPPOSITE SIDEWALL). SEE "NOTE ●" ABOVE.

ALTERNATIVE DOORWAY PROTECTION A-3

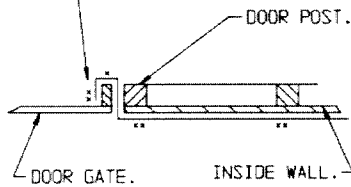
THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT FROM OUTSIDE OF THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET 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 "DOORWAY PROTECTION" DETAIL ON PAGE 41 FOR HEIGHT LOCATIONS.

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 I STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 3 STRAPPING IS NOT AVAILABLE.

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.

VIEW B

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

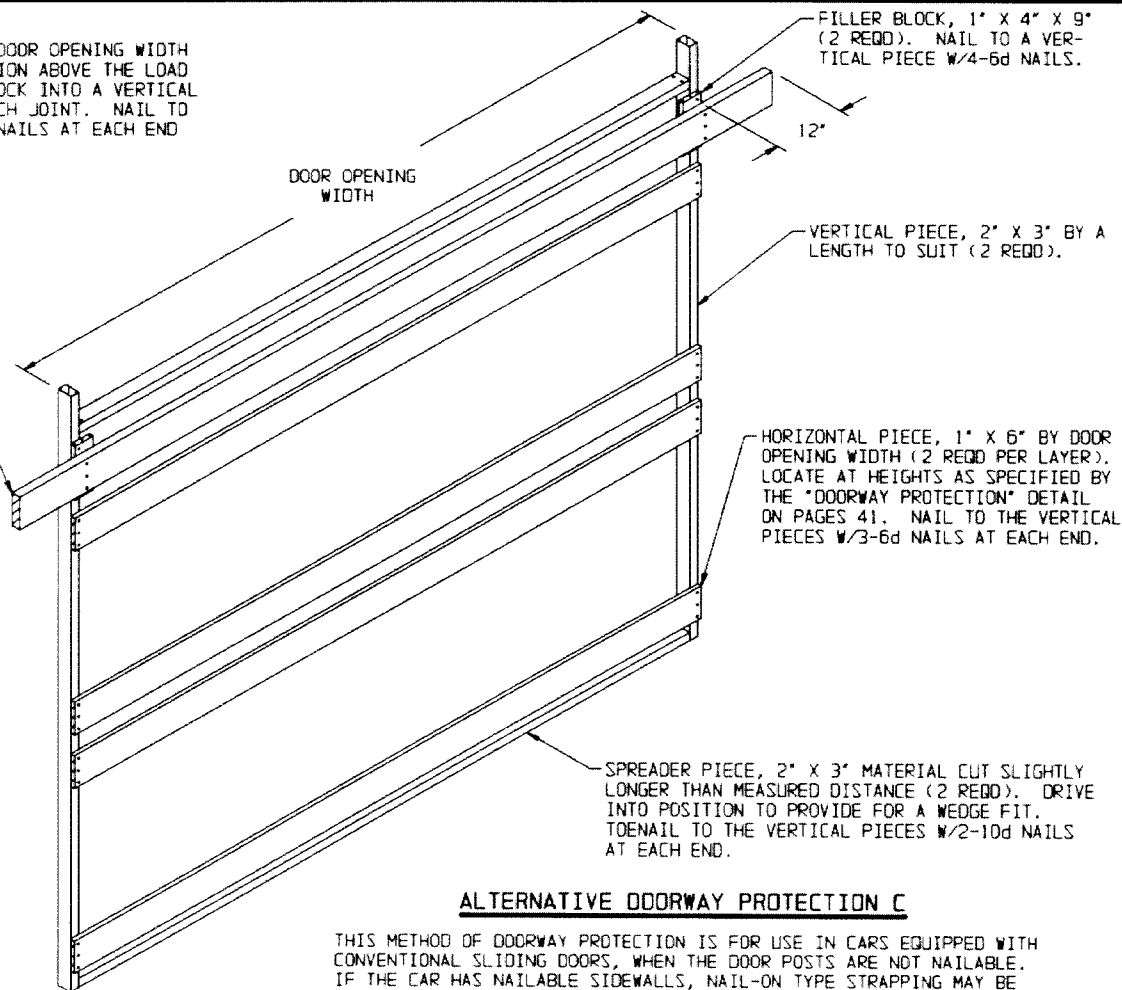
INDICATES CAR SIDEWALL.

INDICATES FLOOR.

ALTERNATIVE DOORWAY PROTECTION B

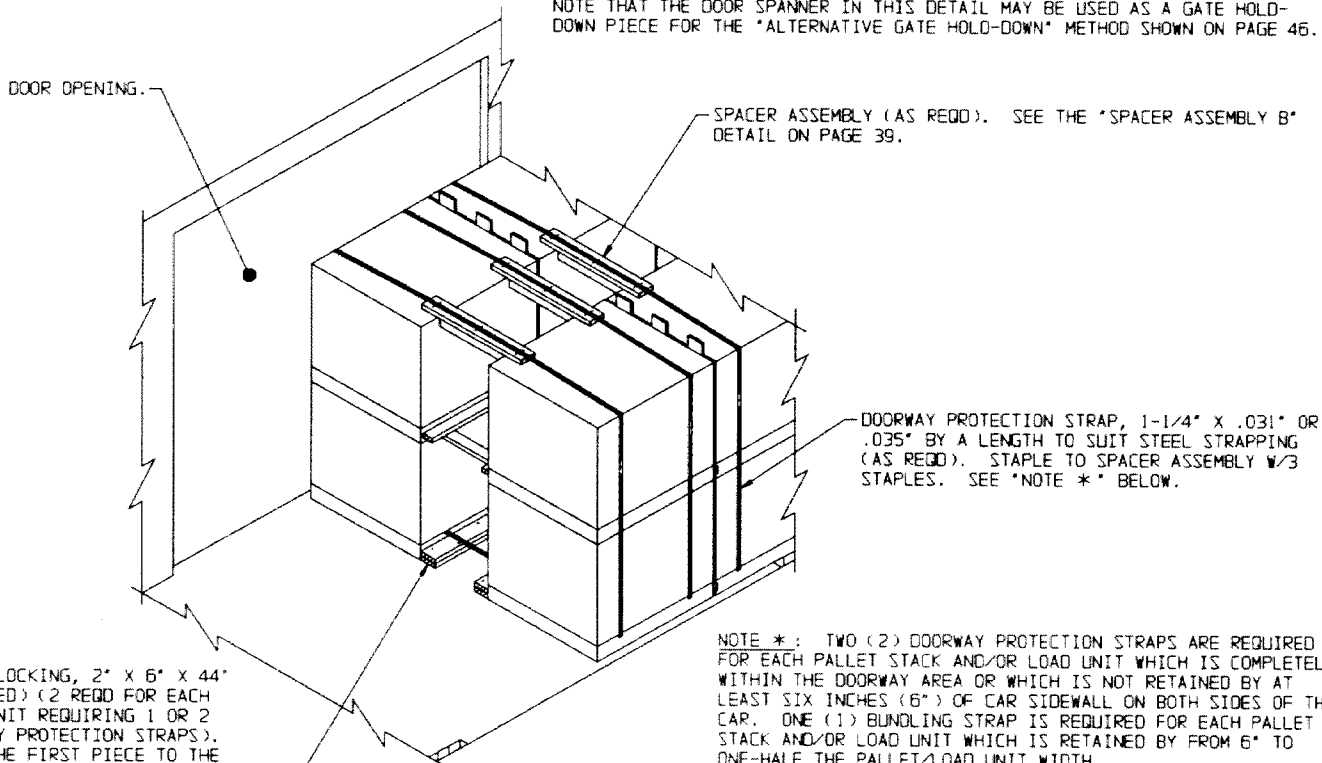
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN IS FOR A TWO-LAYER LOAD.

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/2-12d NAILS AT EACH END (OPTIONAL).



ALTERNATIVE DOORWAY PROTECTION C

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 48 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 46.

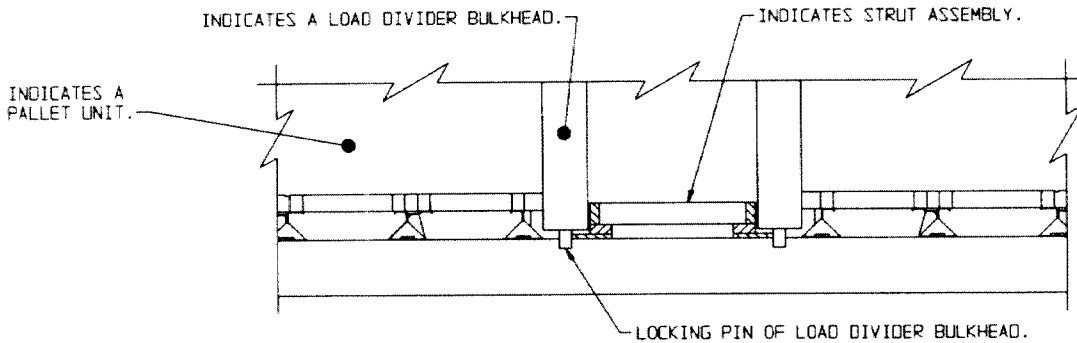


SIDE BLOCKING, 2" X 6" X 44" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING 1 OR 2 DOORWAY PROTECTION STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. OMIT ANTI-SWAY BRACE (S) AT FLOOR LEVEL.

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

ALTERNATIVE DOORWAY PROTECTION D

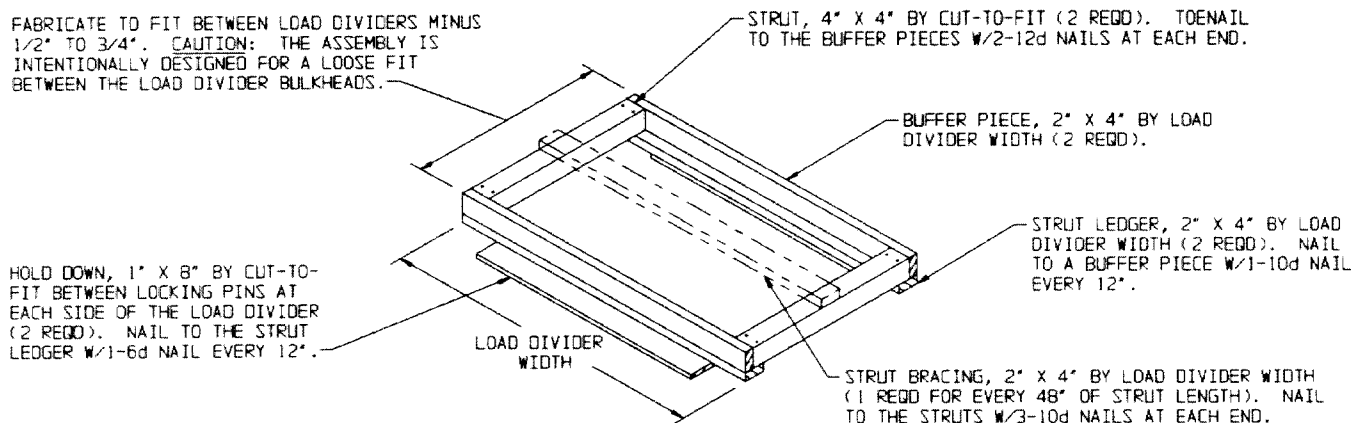
DOORWAY PROTECTION



INSTALLATION OF STRUT ASSEMBLY

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

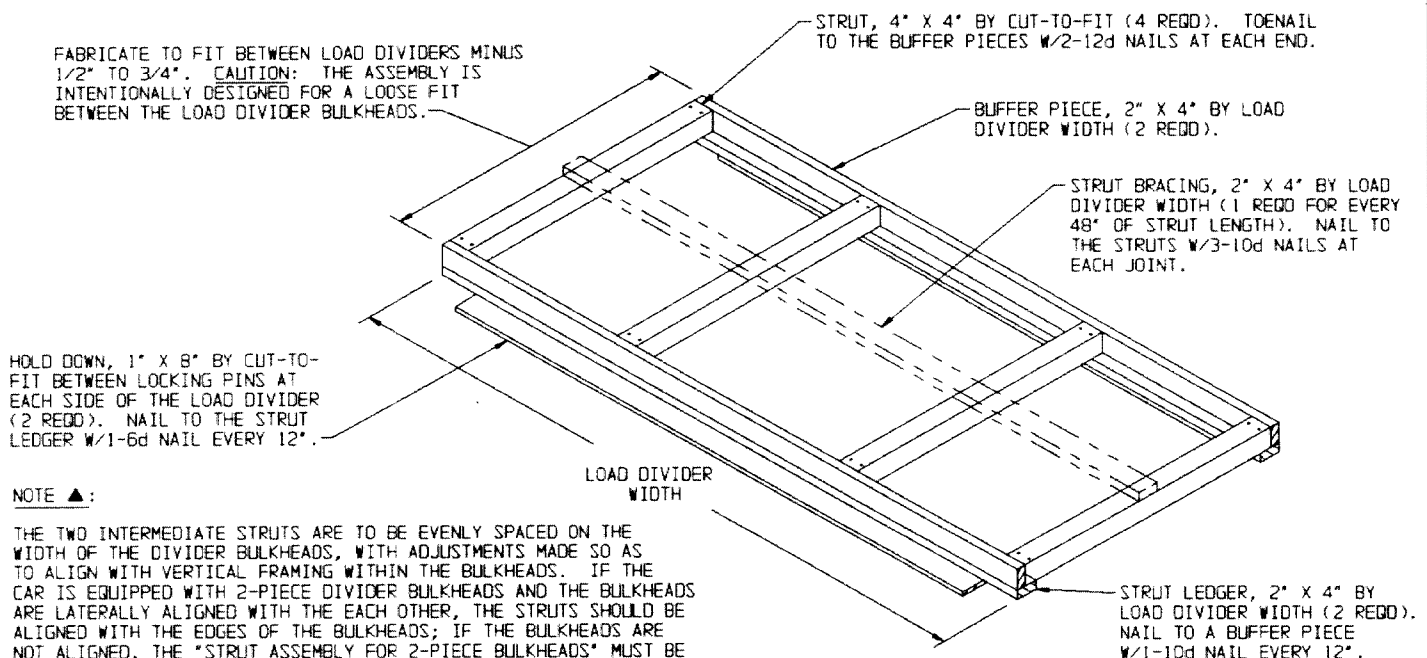
FABRICATE TO FIT BETWEEN LOAD DIVIDERS MINUS 1/2" TO 3/4". CAUTION: THE ASSEMBLY IS INTENTIONALLY DESIGNED FOR A LOOSE FIT BETWEEN THE LOAD DIVIDER BULKHEADS.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE ▲" BELOW.

FABRICATE TO FIT BETWEEN LOAD DIVIDERS MINUS 1/2" TO 3/4". CAUTION: THE ASSEMBLY IS INTENTIONALLY DESIGNED FOR A LOOSE FIT BETWEEN THE LOAD DIVIDER BULKHEADS.

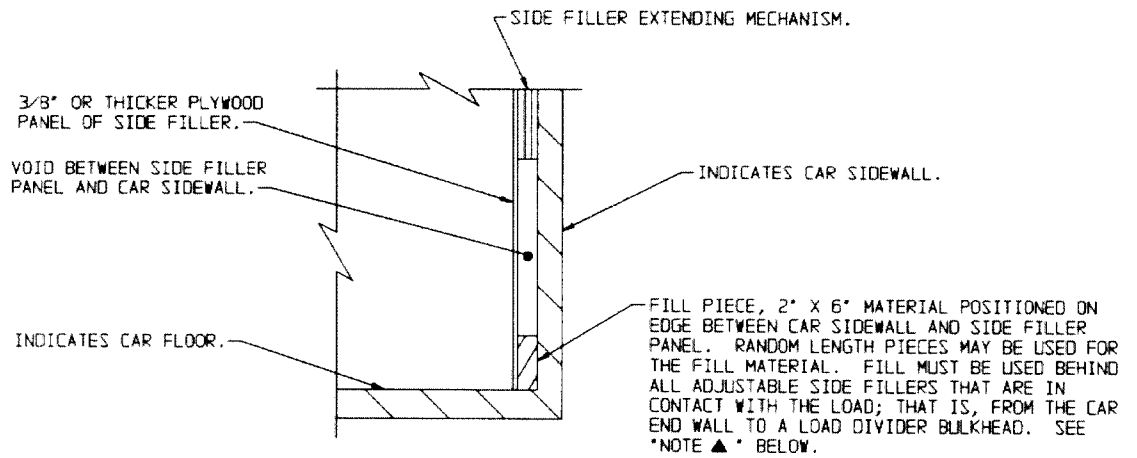


NOTE ▲:

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

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

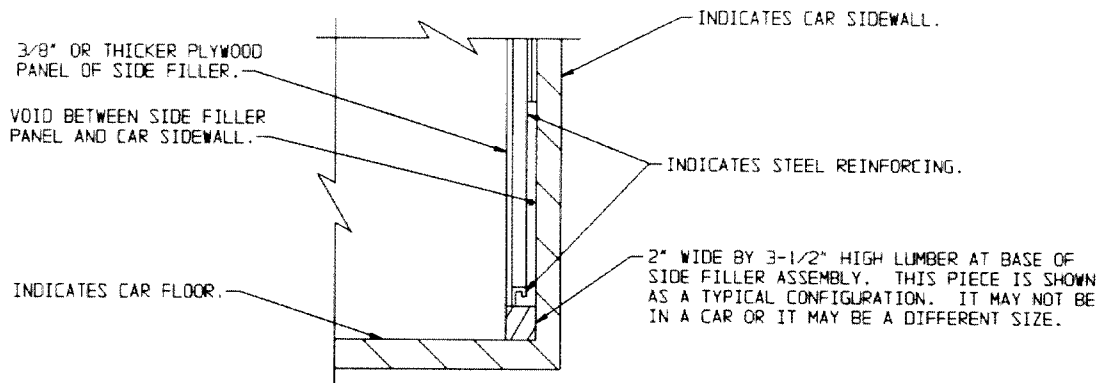


TYPICAL TYPE A

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

NOTE ▲:

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



TYPICAL TYPE B

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

