

APPROVED BY
 BUREAU OF EXPLOSIVES
J. H. Heleman
 DATE 8/19/91

LOADING AND BRACING (CL & LCL) IN BOX CARS OF COMPLETE ROUNDS PACKED IN CYLINDRICAL METAL CONTAINERS AND UNITIZED ON A 40" X 44" WOODEN PALLET

PA116 SERIES CONTAINER

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

THIS PALLET UNIT IS EQUIPPED WITH A METAL ADAPTER WHICH PROVIDES TOP-LIFT CAPABILITIES.

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GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE 120MM COMPLETE ROUND PACKED IN THE PAT16 CONTAINER WHICH IS UNITIZED ON A 40" X 44" WOODEN PALLET AND IS EQUIPPED WITH A METAL ADAPTER TO PROVIDE TOP LIFT CAPABILITIES. SEE THE PICTORIAL VIEW ON PAGE 3. REFER TO THE U.S. ARMY AMC DRAWING 19-48-4079/7B-20PM1002 FOR UNITIZATION PROCEDURES FOR THE PAT16 SERIES CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. **CAUTION:** METAL COMPLETE ROUND CONTAINERS THAT ARE FLUSH WITH OR OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND/OR END WALLS. IF ALL-STEEL CARS ARE USED, THE SIDEWALLS AND/OR END WALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE. REFER TO PAGE 48 FOR GUIDANCE.
- E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF CONTAINERS AGAINST THE CAR END WALL OR SIDEWALL AS APPLICABLE TO THE LOAD BEING SHIPPED. LONGITUDINALLY ADJACENT LENGTHWISE UNITS WILL BE POSITIONED WITH BASE END AGAINST BASE END OR BELL END AGAINST BELL END.
- F. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET UNITS OF COMPLETE ROUNDS IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.
- G. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 49 FOR GUIDANCE.
- H. CONVENTIONAL BOX CARS EQUIPPED WITH SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING 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.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

- LUMBER** ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS** ----- : COMMON, FED SPEC FF-N-105.
- STRAPPING, STEEL** ----- : ASTM D 3953; FLAT STRAPPING, TYPE I OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.
- STRAP SEAL** ----- : ASTM D 3953; CLASS H, FINISH A, B (GRADE 2), OR C, TYPE D, STYLE I, II, OR IV.
- STRAP STAPLE** ----- : COMMERCIAL GRADE.
- PLYWOOD** ----- : GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE** ----- : FED SPEC QQ-W-461.
- HARDBOARD** ----- : ANSI/A9A A135.4, CLASS 1.
- SOLID FIBERBOARD** ----- : FED SPEC PP-F-320, TYPE SF, CLASS DOMESTIC, GRADE 175 OR STRONGER; OR TYPE SF, CLASS WEATHER-RESISTANT, GRADE W65 OR STRONGER.

PAGE 2

(GENERAL NOTES CONTINUED)

- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. 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.
- O. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 47 FOR GUIDANCE.
- P. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDE WALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.
- Q. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. **NOTICE:** A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- R. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL-LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "M" ABOVE.
- S. **NOTICE:** WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. **CAUTION:** WHEN USING A JACK TO COMPACT A LOAD THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- 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 ⑦ AND ⑧ ON PAGE 6. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

(CONTINUED ON PAGE 3)

(GENERAL NOTES CONTINUED)

- 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 51 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.

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-CENTERED. **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

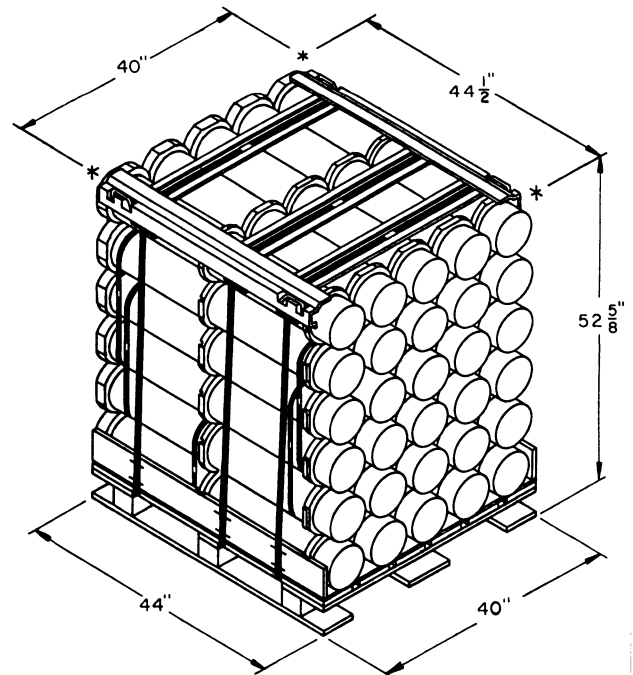
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- 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 FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED, HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 57 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL TYPE B" VIEW ON PAGE 57, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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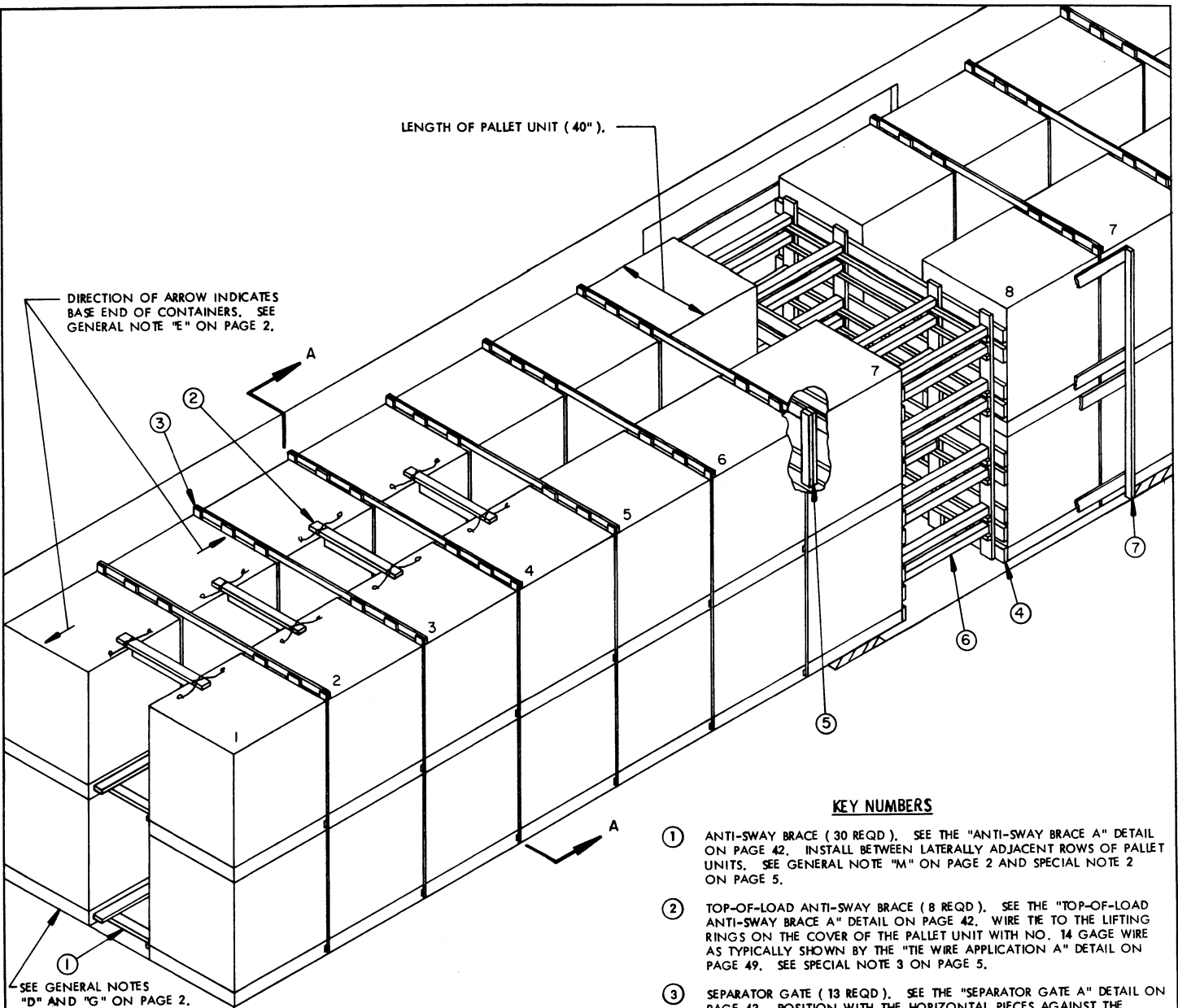
(GENERAL NOTES CONTINUED)

- DD. **NOTICE:** AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 56.
- 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 24 AND 25.
 2. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 20 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 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 37 OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 32.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTION WHICH IS IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHOD.



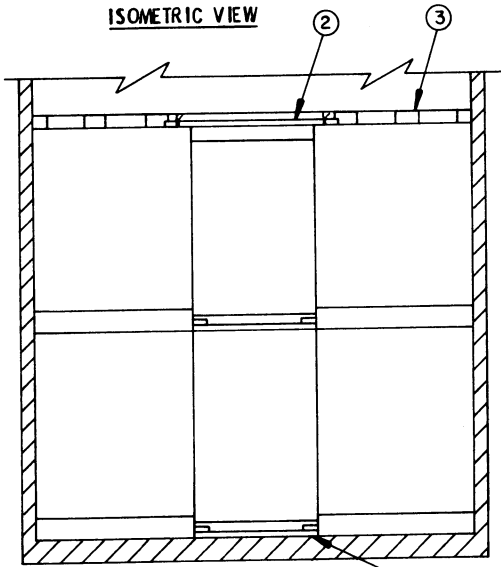
PALLET UNIT

CONTAINER -----30 EACH @ 75 LBS (APPROX)
 CUBE-----54.2 CUBIC FEET (APPROX)
 GROSS WEIGHT-----2,391 LBS (APPROX)



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

ISOMETRIC VIEW



SECTION A-A

KEY NUMBERS

- ① ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 2 ON PAGE 5.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 A" DETAIL ON PAGE 49. SEE SPECIAL NOTE 3 ON PAGE 5.
- ③ SEPARATOR GATE (13 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 THRU 6 ON PAGE 5.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 42. SEE SPECIAL NOTES 8 THRU 10 ON PAGE 5.
- ⑤ CENTER GATE STOP PIECE, 2" X 4" X 30" (DOUBLED) (4 REQD). SEE THE "CENTER GATE A" DETAIL FOR PLACEMENT AND NAILING. SEE SPECIAL NOTE 7 ON PAGE 5.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 45") (32 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 43. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 5.

(SPECIAL NOTES CONTINUED)

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 38 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 41 FOR GUIDANCE.
15. IF A 50'-6" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGES 6 AND 7 FOR LOADING GUIDANCE.
16. 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 D" DETAIL ON PAGE 46. FOR A 2-HIGH LOAD THE 47" AND 68-1/2" 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 39" AND 47" HIGH HORIZONTAL PIECES WILL BE EXTENDED, AND DOUBLED 18" LONG 2" X 4" PIECES APPLIED SO AS TO EXTEND SIX INCHES (6") ABOVE THE TOP HORIZONTAL PIECES.
17. A CAR TO BE USED FOR SHIPMENT OF THE DEPICTED 60-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 155,100 POUNDS.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF THE "ALTERNATIVE DOORWAY PROTECTION E" PROCEDURES AS SHOWN ON PAGE 55 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (7), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 4, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49. 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 2" AND 1" X 3" TIE PIECES ARE LOCATED BETWEEN THE WINGS OF THE PALLET. 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 49 FOR CONSTRUCTION GUIDANCE.
6. WHEN THE "ALTERNATIVE DOORWAY PROTECTION E" PROCEDURES SHOWN ON PAGE 55 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE, PIECE MARKED (7), THE SEPARATOR GATES IN THE DOORWAY AREA MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY WIRE TIEING THE VERTICAL PIECE OF A SEPARATOR GATE TO THE RETAINER PIECE OF THE ADJACENT UPPER ANTI-SWAY BRACE WHICH HAS ALREADY BEEN INSTALLED. IN CARS EQUIPPED WITH STAGGERED DOORS, UP TO FOUR SEPARATOR GATES MAY NEED TO BE WIRE TIED.
7. THE CENTER GATE STOP PIECES, PIECE MARKED (5), 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 24" LONG AND WILL BE POSITIONED SO AS TO EXTEND SIX INCHES (6") ABOVE THE 47" HIGH HORIZONTAL PIECE OF THE CENTER GATE.
8. 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 50 FOR GUIDANCE.
9. 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 (4) IN THE LOAD ON PAGE 4, INSTALL TWO (2) "CENTER GATES D" AS SHOWN ON PAGE 46. 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 50. SEE SPECIAL NOTE 16.
10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 52 FOR GUIDANCE.
11. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (7) IN THE LOAD ON PAGE 4 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 53 THRU 55 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 E" DETAIL ON PAGE 55 FOR GUIDANCE.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) 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 (7) AND (8) ON PAGE 6 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 37 FOR GUIDANCE.

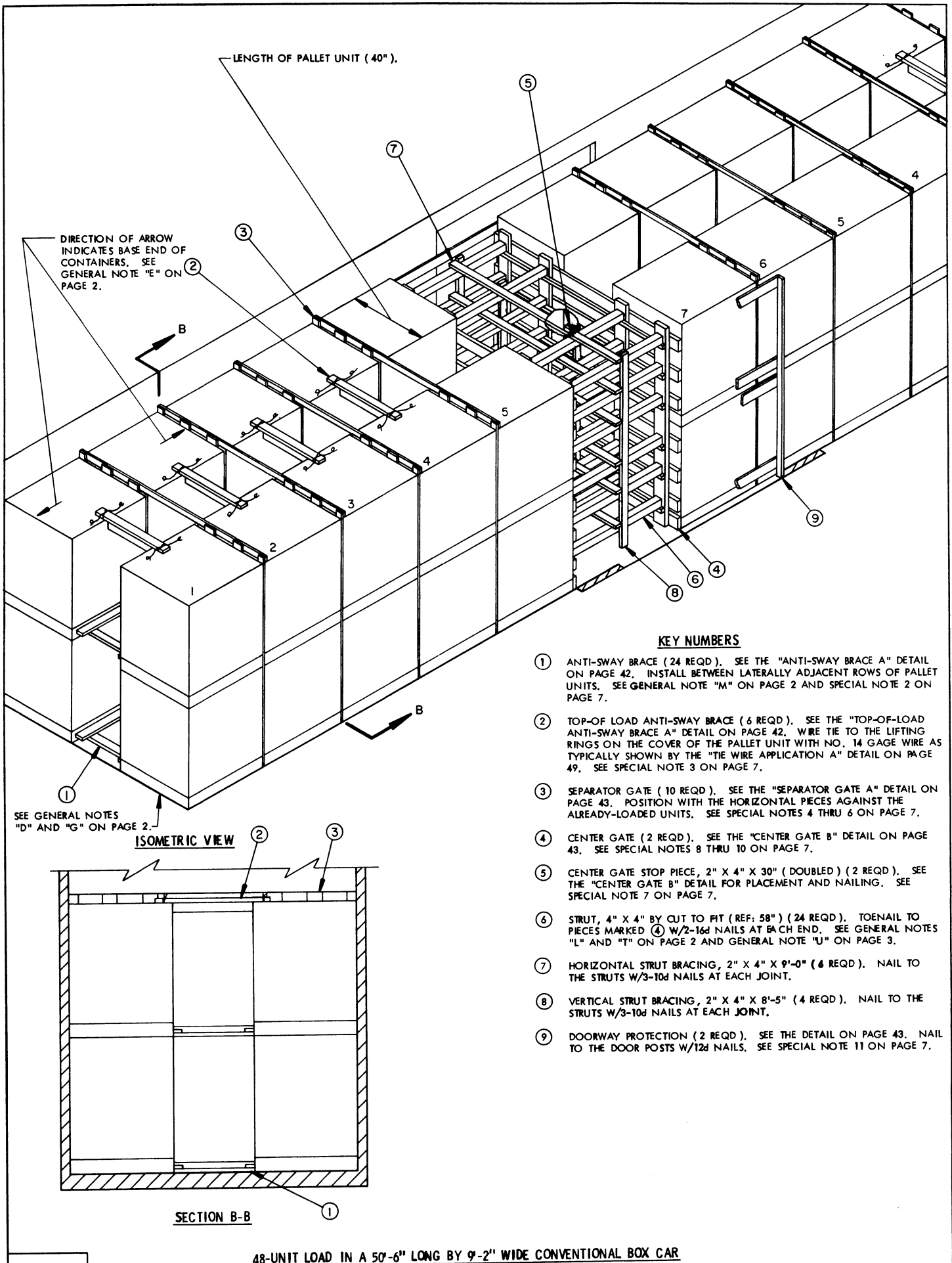
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 2"	118	20
1" X 3"	81	21
1" X 4"	357	119
1" X 6"	557	279
2" X 2"	133	45
2" X 3"	35	18
2" X 4"	470	314
2" X 6"	229	229
4" X 4"	120	160
NAILS	NO. REQD	POUNDS
6d (2")	672	4
10d (3")	776	12
12d (3-1/4")	76	1-1/2
16d (3-1/2")	128	3
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	60	143,460 LBS
DUNNAGE		2,432 LBS

TOTAL WEIGHT-----145,892 LBS (APPROX)



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

LENGTH OF PALLET UNIT (40").

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

ISOMETRIC VIEW

SECTION B-B

KEY NUMBERS

- ① ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 A" DETAIL ON PAGE 49. SEE SPECIAL NOTE 3 ON PAGE 7.
- ③ SEPARATOR GATE (10 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 THRU 6 ON PAGE 7.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 43. SEE SPECIAL NOTES 8 THRU 10 ON PAGE 7.
- ⑤ CENTER GATE STOP PIECE, 2" X 4" X 30" (DOUBLED) (2 REQD). SEE THE "CENTER GATE B" DETAIL FOR PLACEMENT AND NAILING. SEE SPECIAL NOTE 7 ON PAGE 7.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 58") (24 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" X 9'-0" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑧ VERTICAL STRUT BRACING, 2" X 4" X 8'-5" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 43. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 7.

(SPECIAL NOTES CONTINUED)

13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 38 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 41 FOR GUIDANCE.
15. A MAXIMUM OF FORTY (40) PALLET UNITS, FOR A LADING WEIGHT OF APPROXIMATELY 95,640 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR BY USING THE DEPICTED PROCEDURES. SEE SPECIAL NOTE 18.
16. IF A 60'-8" LONG CAR IS FURNISHED FOR LOADING, REFER TO THE PROCEDURES ON PAGES 4 AND 5 FOR LOADING GUIDANCE.
17. WHEN SPLIT GATES ARE TO BE USED IN 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 E" DETAIL ON PAGE 46. FOR A 2-HIGH LOAD, THE 47" AND 68-1/2" 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 SO AS TO BE IN CONTACT WITH THE PALLET UNITS AND NAILED TO THESE EXTENSIONS. FOR A 1-HIGH LOAD THE 31-1/2" AND 47" HIGH HORIZONTALS WILL BE EXTENDED, AND DOUBLED 2" X 4" PIECES APPLIED SO AS TO EXTEND SIX INCHES (6") ABOVE THE TOP HORIZONTAL PIECE.
18. A CAR TO BE USED FOR SHIPMENT OF THE DEPICTED 48-UNIT OFFSET LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 129,600 POUNDS. A 40'-6" LONG CAR FOR SHIPMENT OF A 40-UNIT OFFSET LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 104,000 POUNDS; AN EVENLY DISTRIBUTED 40-UNIT LOAD WILL REQUIRE A CAR HAVING A LOAD LIMIT OF 97,200 POUNDS OR GREATER.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF THE "ALTERNATIVE DOORWAY PROTECTION E" PROCEDURES AS SHOWN ON PAGE 55 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (9), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49. 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" TIE PIECES ARE LOCATED BETWEEN THE WINGS OF THE PALLETS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
5. WHEN THE "ALTERNATIVE DOORWAY PROTECTION E" PROCEDURES SHOWN ON PAGE 55 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE, PIECE MARKED (9), THE SEPARATOR GATES IN THE DOORWAY AREA MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY WIRE TIEING THE VERTICAL PIECE OF A SEPARATOR GATE TO THE RETAINER PIECE OF THE ADJACENT UPPER ANTI-SWAY BRACE WHICH HAS ALREADY BEEN INSTALLED. IN CARS EQUIPPED WITH STAGGERED DOORS, UP TO FOUR SEPARATOR GATES MAY NEED TO BE WIRE TIED.
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 49 FOR CONSTRUCTION GUIDANCE.
7. THE CENTER GATE STOP PIECES, PIECE MARKED (5), 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 24" LONG AND WILL BE POSITIONED SO AS TO EXTEND SIX INCHES (6") ABOVE THE 47" HIGH HORIZONTAL PIECE OF THE CENTER GATE.
8. CENTER GATE "B" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 50 FOR GUIDANCE.
9. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE B" SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES E" AS SHOWN ON PAGE 46. 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 50. SEE SPECIAL NOTE 17.
10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "B", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 52 FOR GUIDANCE.
11. 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 (9) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 53 THRU 55 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 E" DETAIL ON PAGE 55 FOR GUIDANCE.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 17 THRU 37 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 2"	92	16
1" X 3"	62	16
1" X 4"	275	92
1" X 6"	447	224
2" X 2"	100	34
2" X 3"	35	18
2" X 4"	456	304
2" X 6"	192	192
4" X 4"	116	155
NAILS	NO. REQD	POUNDS
6d (2")	528	3-1/4
10d (3")	732	11-1/2
12d (3-1/4")	66	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----	60' REQD-----	1 LB

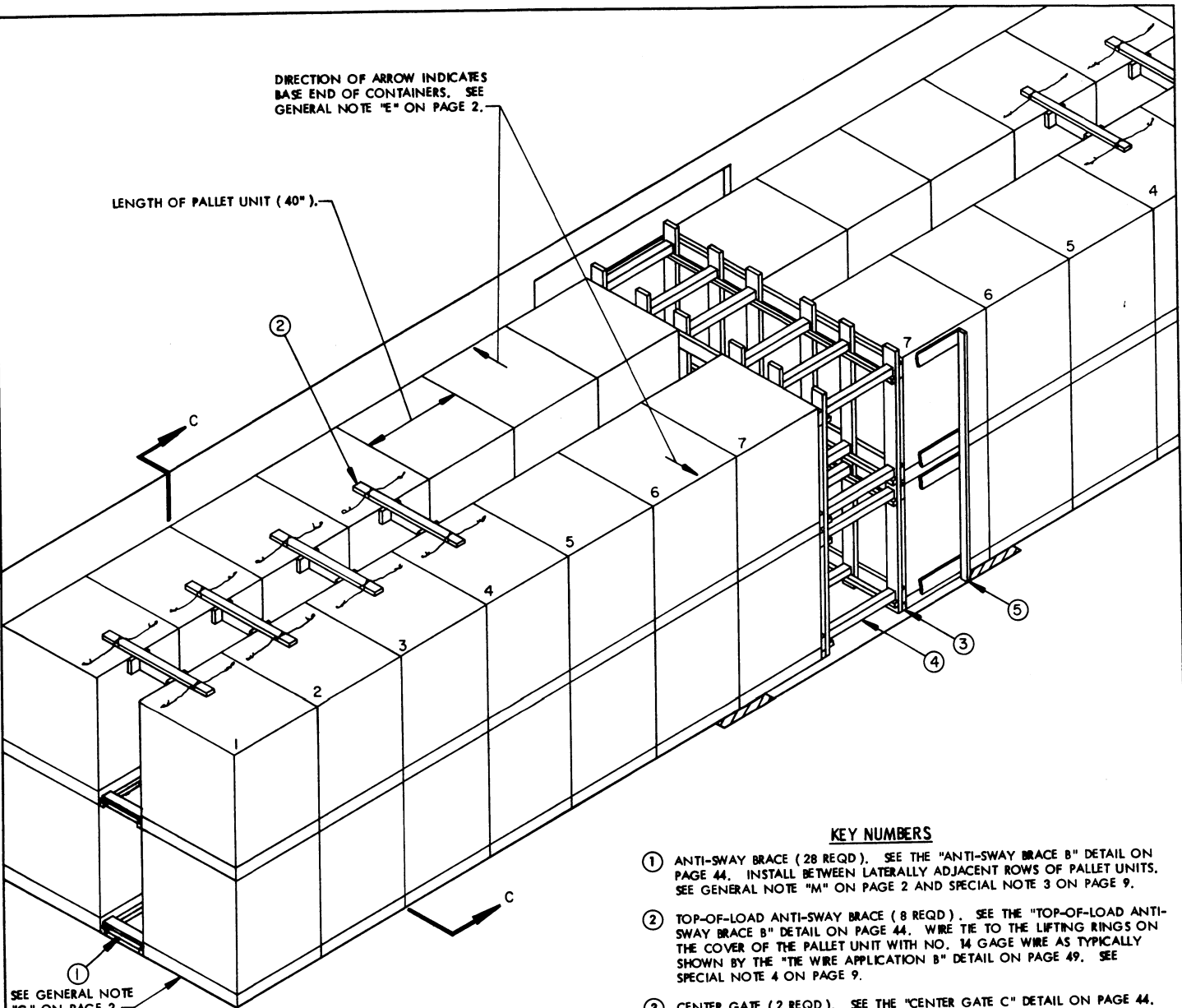
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS -----	48 -----	114,768 LBS
DUNNAGE -----	-----	2,122 LBS

TOTAL WEIGHT-----116,890 LBS (APPROX)

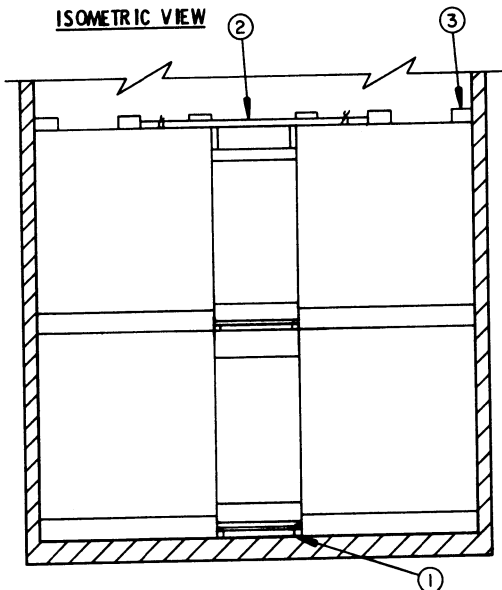
DIRECTION OF ARROW INDICATES
BASE END OF CONTAINERS. SEE
GENERAL NOTE "E" ON PAGE 2.

LENGTH OF PALLET UNIT (40").



SEE GENERAL NOTE
"G" ON PAGE 2.

ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

- ① ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 44. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 44. 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 B" DETAIL ON PAGE 49. SEE SPECIAL NOTE 4 ON PAGE 9.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 44. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 9.
- ④ STRUTS, 4" X 4" BY CUT-TO-FIT (REF: 40") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE DETAIL ON PAGE 43. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 9.

56-UNIT LOAD IN A 58'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

SPECIAL NOTES:

14. A 40'-6" LONG CAR TO BE USED FOR SHIPMENT OF A 44-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 116,100 POUNDS. A 60'-8" LONG CAR TO BE USED FOR SHIPMENT OF A 68-UNIT LOAD MUST HAVE A LOAD LIMIT OF 173,700 POUNDS OR GREATER.

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 2 BELOW.
2. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR 50'-6" LONG CARS. CAUTION: AN OFFSET LOADING PATTERN MUST NOT BE USED; NOT MORE THAN SEVEN (7) LOAD UNITS WILL BE POSITIONED IN ONE END OF A 50'-6" LONG CAR. SEE SPECIAL NOTE 13.
3. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, OR IF THE "ALTERNATIVE DOORWAY PROTECTION E" SHOWN ON PAGE 55 IS TO BE USED IN A CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS, NAILED FLOOR-LINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 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 B" DETAIL ON PAGE 49. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 50'-6" OR A 40'-6" LONG CAR.
5. CENTER GATE "C" 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 50 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE C", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 8, INSTALL TWO (2) "CENTER GATES F" AS SHOWN ON PAGE 47. 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 50.
7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" HOLD DOWNS ON CENTER GATES "C", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 52 FOR GUIDANCE.
8. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 8 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 53 THRU 55 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 FLOOR-LINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE PIECES MARKED (3), (4), AND (6) IN THE LOAD ON PAGE 14 FOR GUIDANCE.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) 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 HORIZONTAL AND VERTICAL STRUT BRACING WILL BE REQUIRED WHEN OMITTING A LOAD UNIT. THE HORIZONTAL BRACING PIECES WILL BE CAR WIDTH MINUS 1/2" IN LENGTH AND THE VERTICAL PIECES WILL BE 8'-9" LONG. SEE PIECES MARKED (7) AND (8) ON PAGE 6 FOR A TYPICAL INSTALLATION. 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 37 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 39 AND 40 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 41 FOR GUIDANCE.
12. A MAXIMUM OF FORTY-FOUR (44) PALLET UNITS, FOR A LADING WEIGHT OF APPROXIMATELY 105,204 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.
13. IF A 60'-8" LONG CAR IS FURNISHED FOR LOADING, A MAXIMUM OF SIXTY-EIGHT (68) PALLET UNITS CAN BE LOADED FOR A LADING WEIGHT OF APPROXIMATELY 162,588 POUNDS. THE LOADING PROCEDURES SPECIFIED FOR A 50'-6" LONG CAR WILL APPLY EXCEPT THAT DOUBLED 2" X 6" STRUTS MUST BE USED IN LIEU OF THE DEPICTED 4" X 4" STRUTS. LAMINATE THE TOP PIECE TO THE LOWER PIECE W/1-10d NAIL EVERY 6" AND TOENAIL EACH END TO THE VERTICAL PIECES OF THE CENTER GATES W/2-12d NAILS AT EACH END. ADDITIONALLY, FIVE (5) TOP-OF-LOAD ANTI-SWAY BRACES, PIECES MARKED (2), WILL BE REQUIRED IN EACH END OF THE LOAD. SEE SPECIAL NOTE 14.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	130	44
1" X 6"	64	32
2" X 2"	259	87
2" X 3"	42	21
2" X 4"	164	110
2" X 6"	205	205
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
6d (2")	552	3-1/4
10d (3")	524	8-1/4
12d (3-1/4")	148	2-1/2
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----90' REQD-----1-1/2 LBS		

LOAD AS SHOWN

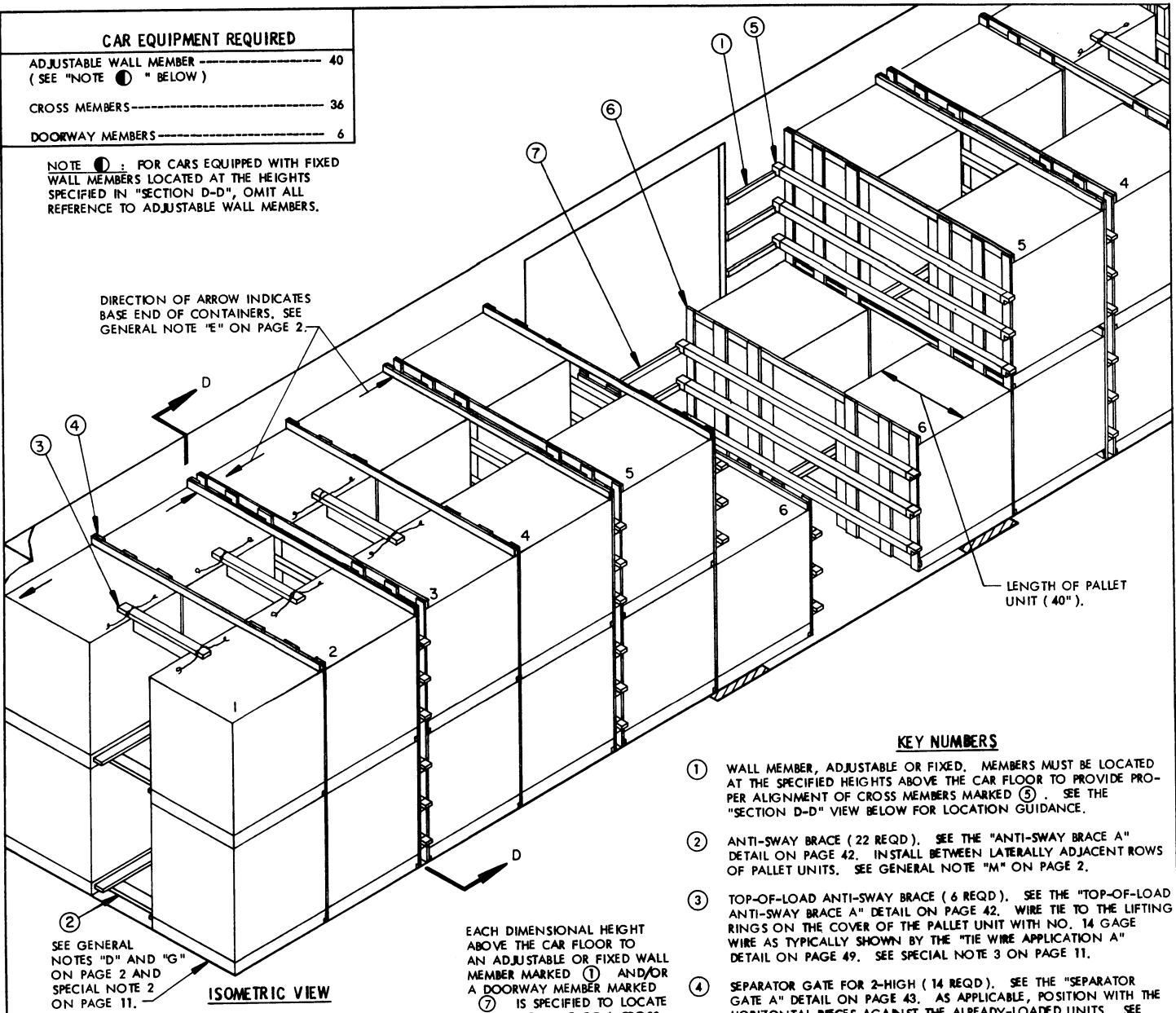
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	56	133,896 LBS
DUNNAGE		1,230 LBS
TOTAL WEIGHT		135,126 LBS (APPROX)

CAR EQUIPMENT REQUIRED

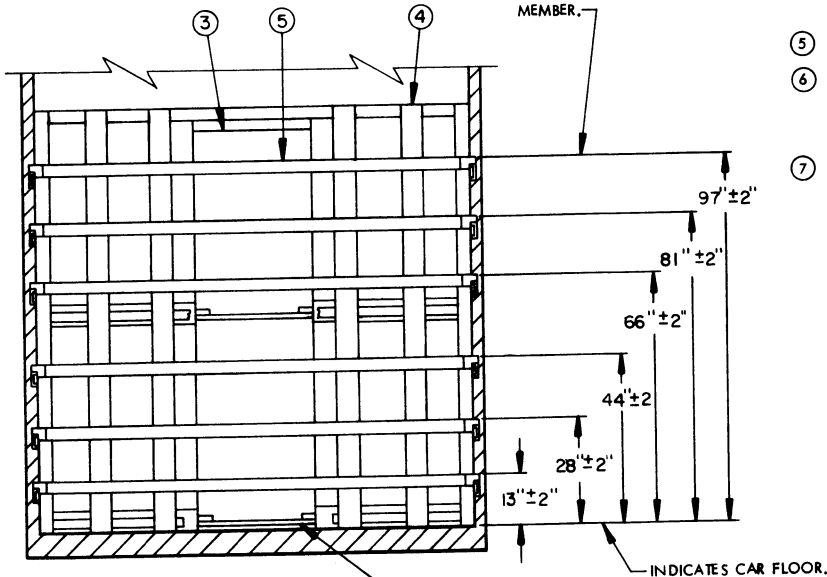
ADJUSTABLE WALL MEMBER -----	40
(SEE "NOTE 1" BELOW)	
CROSS MEMBERS -----	36
DOORWAY MEMBERS -----	6

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

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



ISOMETRIC VIEW



SECTION D-D

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 3. SEE THE "SECTION D-D" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (22 REQ'D). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQ'D). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 A" DETAIL ON PAGE 49. SEE SPECIAL NOTE 3 ON PAGE 11.
- 4 SEPARATOR GATE FOR 2-HIGH (14 REQ'D). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.
- 5 CROSS MEMBER (36 REQ'D). SEE GENERAL NOTE "X" ON PAGE 3.
- 6 SEPARATOR GATE FOR 1-HIGH (2 REQ'D). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. AS APPLICABLE, POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTES 4 AND 5 ON PAGE 11.
- 7 DOORWAY MEMBER (6 REQ'D). SEE THE "SECTION D-D" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 6 ON PAGE 11.

EACH DIMENSIONAL 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.

SPECIAL NOTES:

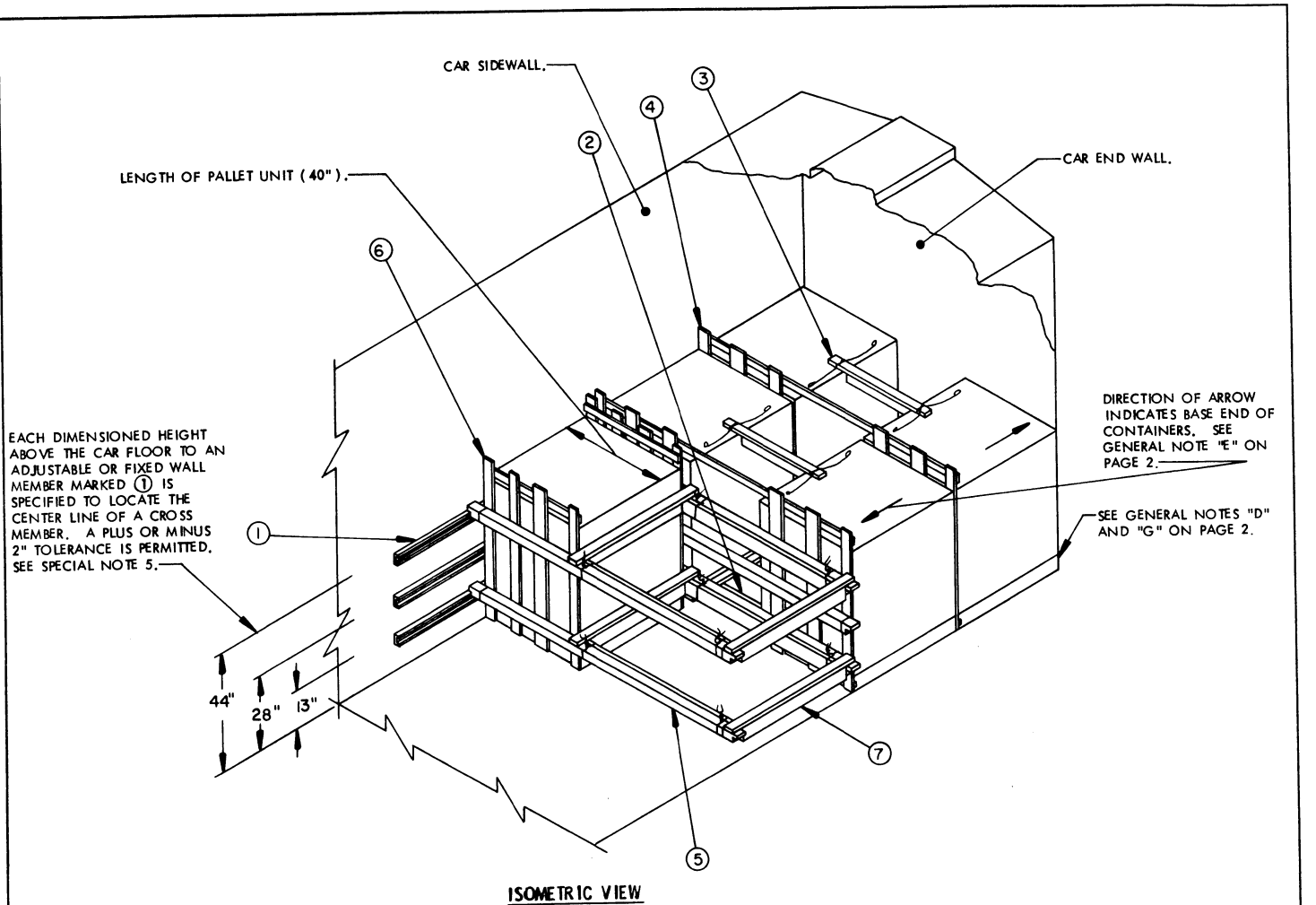
1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE, EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "G" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE SHOWN AS PIECE MARKED ④ MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES 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 A" DETAIL ON PAGE 49. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING 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 2" AND THE 1" X 3" TIE PIECES ARE LOCATED BETWEEN THE WINGS OF THE PALLETS. 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 49 FOR CONSTRUCTION GUIDANCE.
6. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AN ADDITIONAL FOUR PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.
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 ONE OR TWO LAYERS 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 41 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 2"	128	22
1" X 3"	99	25
1" X 4"	423	141
1" X 6"	553	277
2" X 4"	326	218
NAILS	NO. REQD	POUNDS
6d (2")	744	4-1/2
10d (3")	264	4-1/4
12d (3-1/4")	30	1/2
WIRE, NO. 14 GAGE-----60' REQD-----1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT
PALLET UNIT	44	105,204 LBS
DUNNAGE		1,377 LBS
TOTAL WEIGHT		106,581 LBS (APPROX)



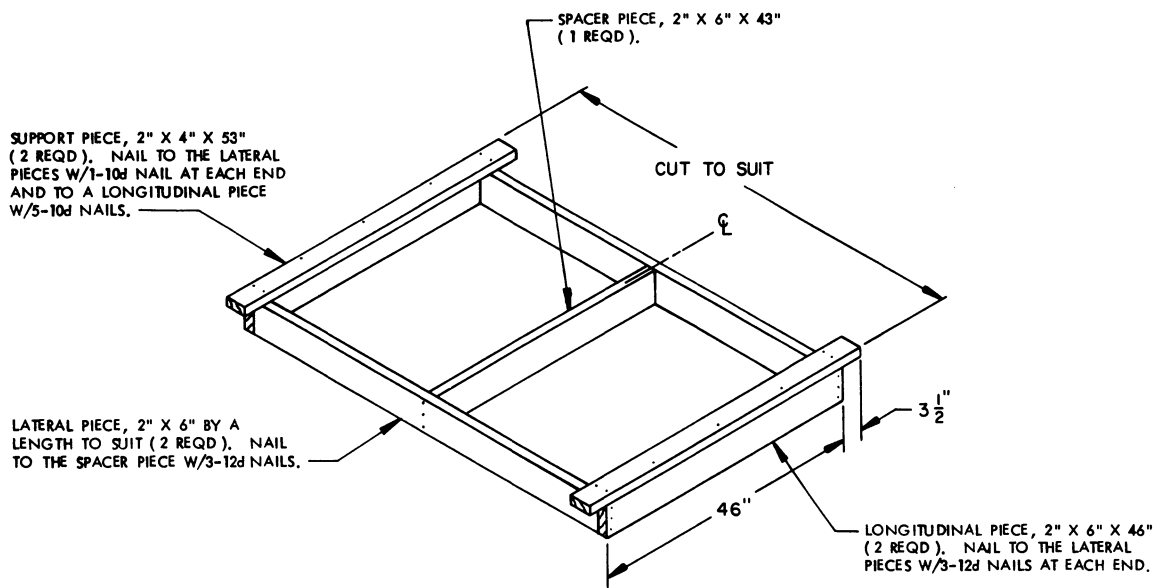
SPECIAL NOTES:

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 A 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 TO BE CAR WIDTH MINUS 1/2" IN LENGTH; FOR THE HEIGHT OF THE GATE, 48" WIDE 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

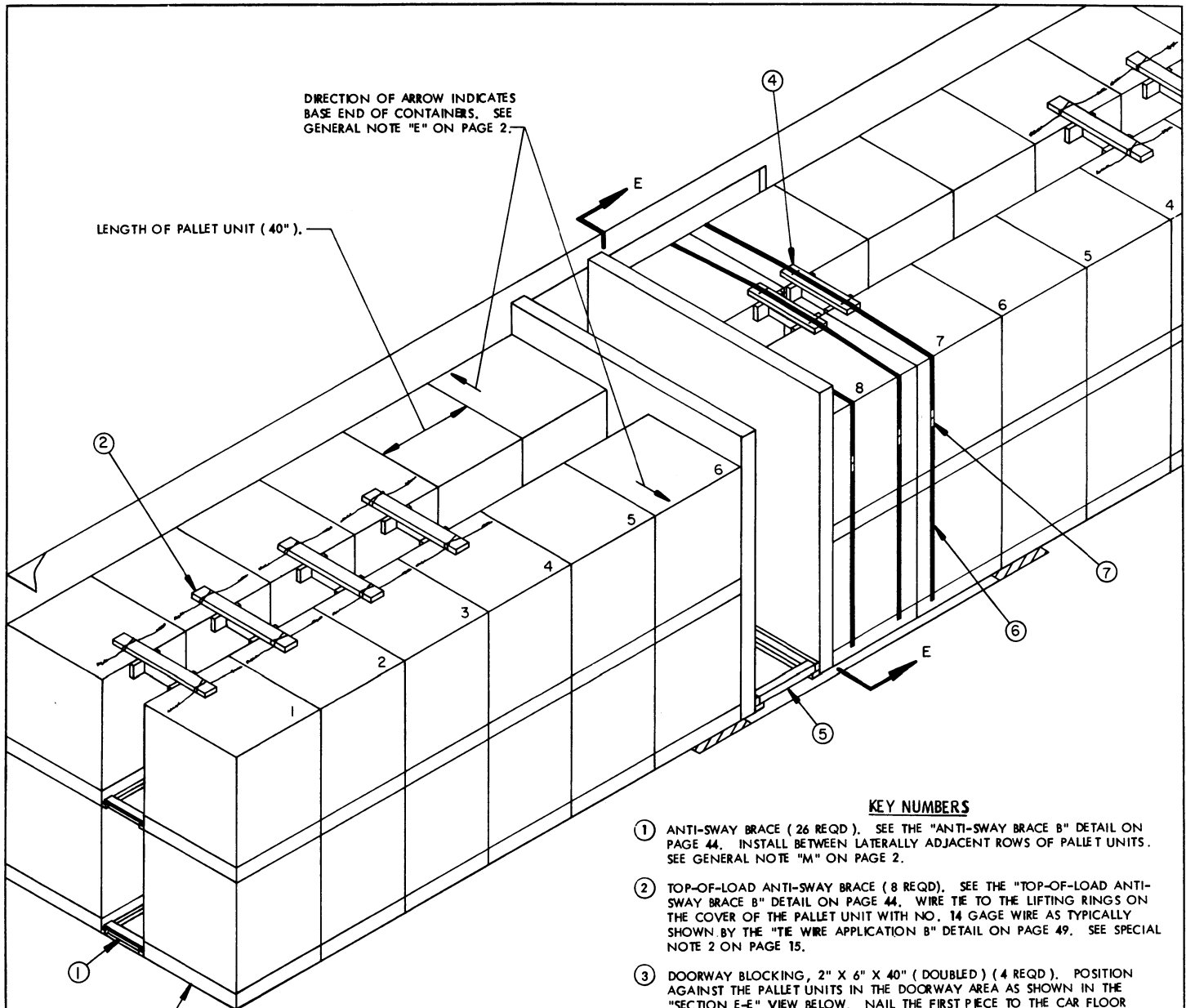
- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE SPECIAL NOTE 5.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49. SEE SPECIAL NOTE 3.
- ④ SEPARATOR GATE FOR 1-HIGH BY 2-WIDE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. POSITION AS SHOWN WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTE 4.
- ⑤ CROSS MEMBER (5 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH BY 1-WIDE (2 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 45.
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 13 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2-WRAPPS 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



SPACER ASSEMBLY A

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

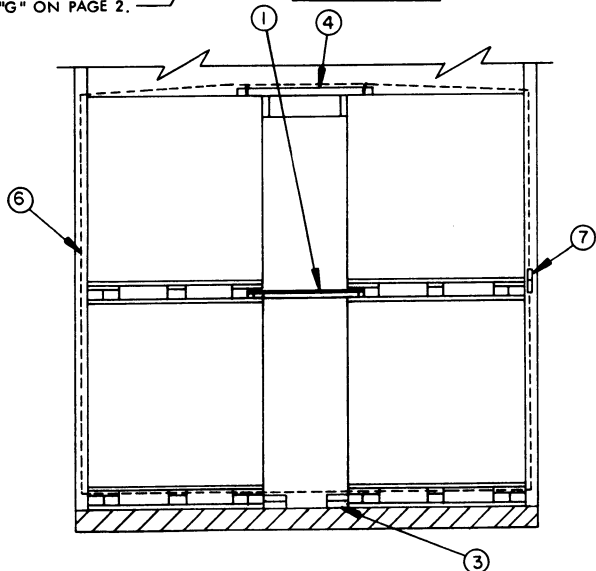


DIRECTION OF ARROW INDICATES
BASE END OF CONTAINERS. SEE
GENERAL NOTE "E" ON PAGE 2.

LENGTH OF PALLET UNIT (40").

ISOMETRIC VIEW

SEE GENERAL NOTE
"G" ON PAGE 2.



SECTION E-E

KEY NUMBERS

- ① ANTI-SWAY BRACE (26 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 44. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 44. 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 B" DETAIL ON PAGE 49. SEE SPECIAL NOTE 2 ON PAGE 15.
- ③ DOORWAY BLOCKING, 2" X 6" X 40" (DOUBLED) (4 REQD). POSITION AGAINST THE PALLET UNITS IN THE DOORWAY AREA AS SHOWN IN THE "SECTION E-E" 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 3 ON PAGE 15.
- ④ SPACER ASSEMBLY (3 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 45.
- ⑤ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 56. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 4 ON PAGE 15.
- ⑥ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 38'-0" (3 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT STACKS AND SPACER IN THE DOORWAY AREA. STAPLE TO THE SPACER W/2 STAPLES. SEE SPECIAL NOTE 3 ON PAGE 15.
- ⑦ SEAL FOR 1-1/4" STRAPPING (6 REQD). DOUBLE CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "O" ON PAGE 7.

SPECIAL NOTES:

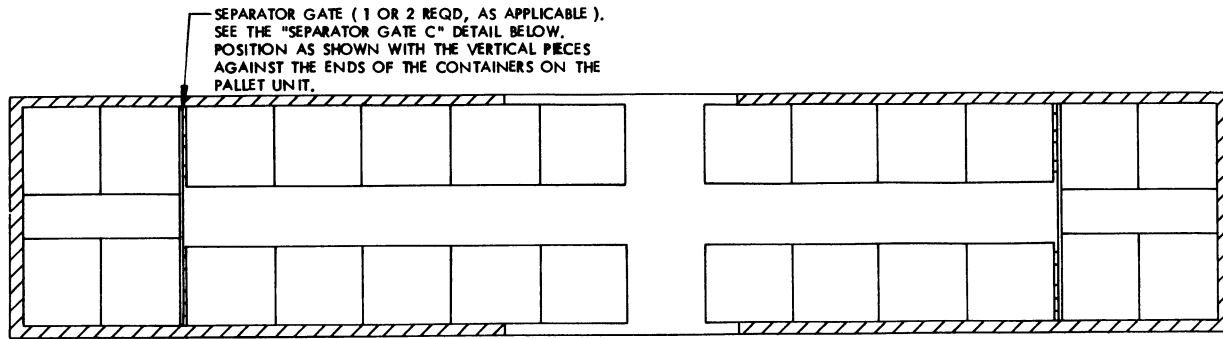
1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LIFTING RINGS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 49. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD WHEN USING A 40'-6" OR A 50'-6" LONG CAR; FIVE (5) BRACES ARE REQUIRED WHEN LOADING A 60'-8" LONG CAR.
3. 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 CARS EQUIPPED WITH EITHER SLIDING TYPE OR PLUG TYPE DOORS, OR A COMBINATION THEREOF. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING TYPE DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED ⑤ ON PAGE 8, OR ANY OF THE ALTERNATIVES ON PAGES 53 THRU 55 MAY BE USED.
4. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑤ 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 FIVE (5) LOAD UNITS.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 17 THRU 37 FOR GUIDANCE.
6. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 39 AND 40 FOR SHIPPING GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 41 FOR GUIDANCE.
8. A CAR TO BE USED FOR SHIPMENT OF THE DEPICTED 56-UNIT OFFSET LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 145,800 POUNDS. SIXTY-EIGHT (68) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 162,588 POUNDS, CAN BE LOADED IN A 60'-8" LONG LOAD DIVIDER CAR HAVING A LOAD LIMIT OF AT LEAST 173,100 POUNDS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	121	41
1" X 8"	16	11
2" X 4"	170	114
2" X 6"	68	68
4" X 4"	11	15
NAILS	NO. REQD	POUNDS
6d (2")	484	3
10d (3")	226	3-1/2
12d (3-1/4")	170	3
16d (3-1/2")	56	1-1/4
STEEL STRAPPING, 1-1/4" -----	114' REQD -----	29 LBS
SEAL FOR 1-1/4" STRAPPING -----	6 REQD -----	NIL
STAPLES -----	6 REQD -----	NIL
WIRE, NO. 14 GAGE -----	90' REQD -----	1-1/2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	56 -----	133,896 LBS
DUNNAGE -----	-----	540 LBS

TOTAL WEIGHT ----- 134,436 LBS (APPROX)

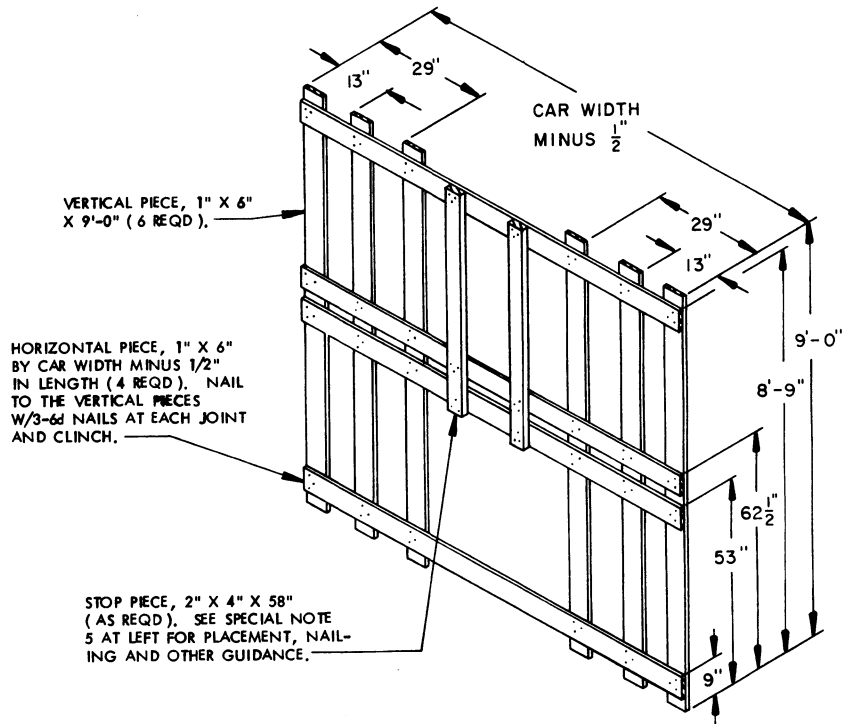


TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

SPECIAL NOTES:

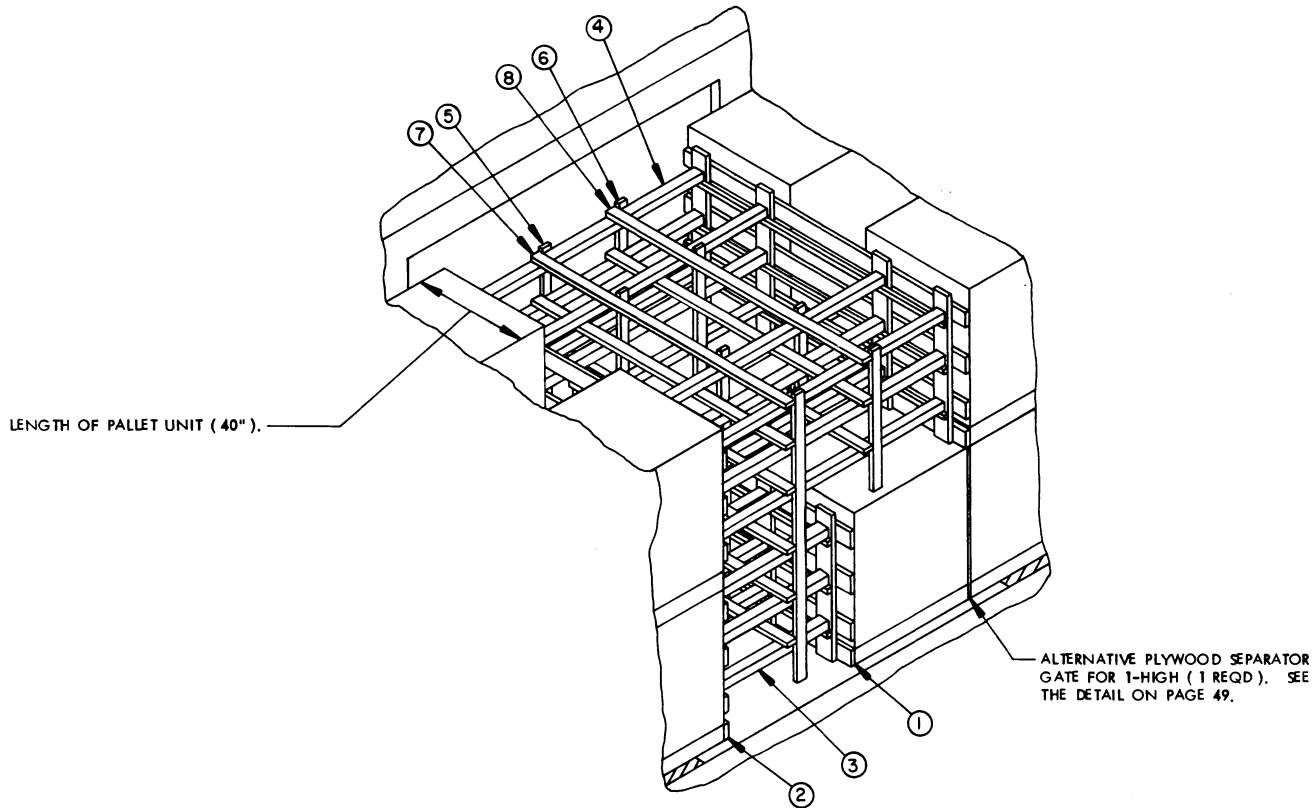
1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE ARE PRESENTED TO PROVIDE AN ALTERNATIVE METHOD OF OBTAINING A LOAD QUANTITY OTHER THAN THAT SHOWN IN ANY OF THE LOADS DEPICTED HEREIN OR AS COVERED BY THE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

LOAD CHART			
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
50'-6"	28	CROSSWISE LOAD ON PAGE 8	40"
	26	4 LONG AT 40" PLUS 9 WIDE AT 44-1/2"	30"
	26	3 LONG AT 40" PLUS 10 WIDE AT 44-1/2"	25"
	24	LENGTHWISE LOAD ON PAGE 6	58"
60'-8"	34	CROSSWISE LOAD ON PAGE 8	42"
	32	5 LONG AT 40" PLUS 11 WIDE AT 44-1/2"	22"
	30	LENGTHWISE LOAD ON PAGE 4	45"



SEPARATOR GATE C

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



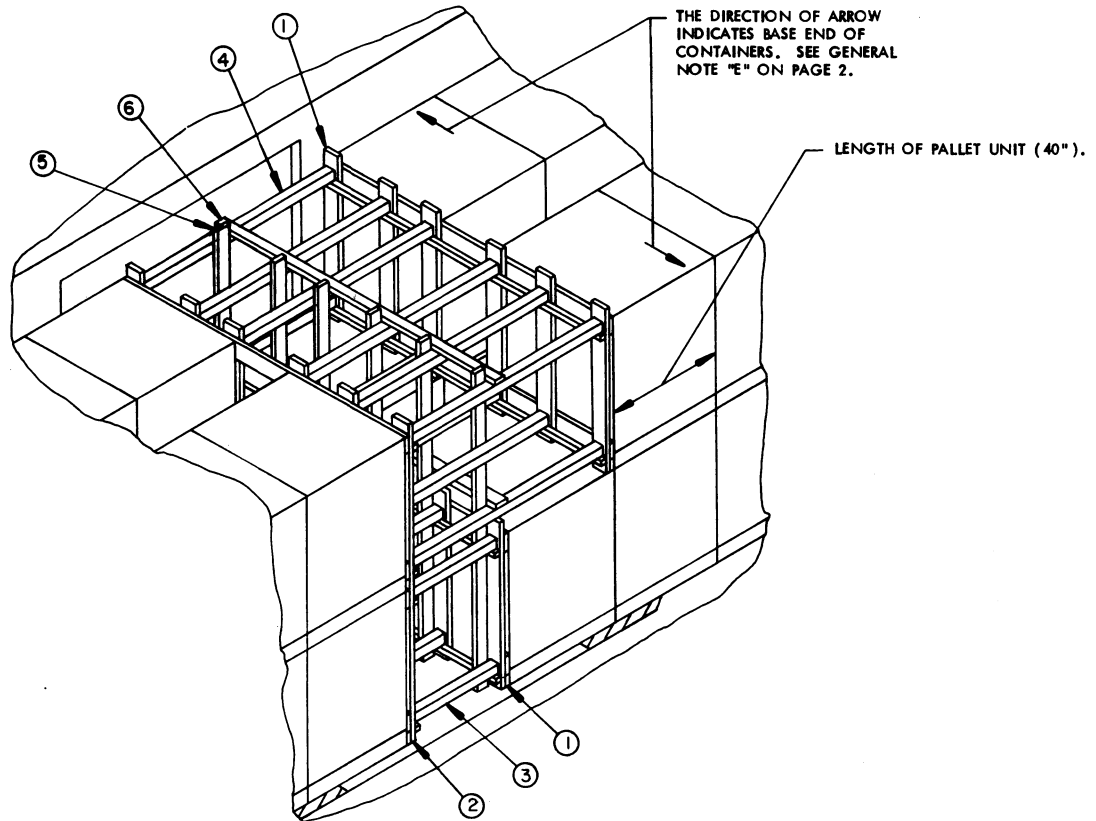
ISOMETRIC VIEW

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 6 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 4. CENTER GATE "A" MUST BE USED IN LIEU OF EACH CENTER GATE "B", AND IF A FULL LOAD MINUS TWO PALLET UNITS IS TO BE SHIPPED, ONLY ONE SET OF STRUT BRACING WILL BE REQUIRED. THIS WILL BE FOUR (4) 48" LONG STRUT BRACING PIECES AND FOUR (4) HORIZONTAL STRUT BRACING PIECES.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 43. SEE GENERAL NOTE "M" ON PAGE 2. SEE SPECIAL NOTE 3 AT LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 43.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN PIECES MARKED ① AND ② IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "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 W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 8'-5" (4 REQD). NAIL TO THE STRUTS MARKED ③ AND ④ W/3-10d NAILS AT EACH JOINT.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 49" (4 REQD). NAIL TO THE STRUTS MARKED ④ W/3-10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" X 9'-0" (6 REQD). NAIL TO THE STRUTS MARKED ③ AND ④ W/3-10d NAILS AT EACH JOINT.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 9'-0" (3 REQD). NAIL TO THE STRUTS MARKED ④ W/3-10d NAILS AT EACH JOINT.



ISOMETRIC VIEW

SPECIAL NOTES:

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

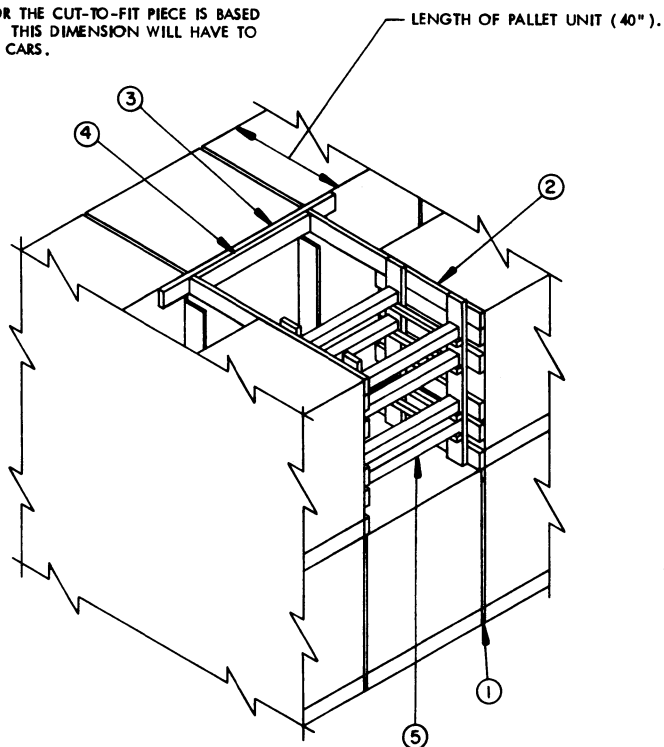
KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 44. SEE GENERAL NOTE "M" ON PAGE 2.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 44.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ②, IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L" AND "T" ON PAGE 2 AND GENERAL NOTE "U" ON PAGE 3. SEE SPECIAL NOTE 3 AT LEFT.
- ④ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ②, IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 9'-0" (6 REQD). NAIL TO THE STRUTS, PIECES MARKED ③ AND ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ③ AND ④, W/3-10d NAILS AT EACH JOINT.

CROSSWISE-POSITIONED PALLET UNITS
 TYPICAL LCL LOAD USING STRUTTED-GATE METHOD OF PARTIAL-LAYER BRACING

(SPECIAL NOTES CONTINUED)

- 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.



ISOMETRIC VIEW

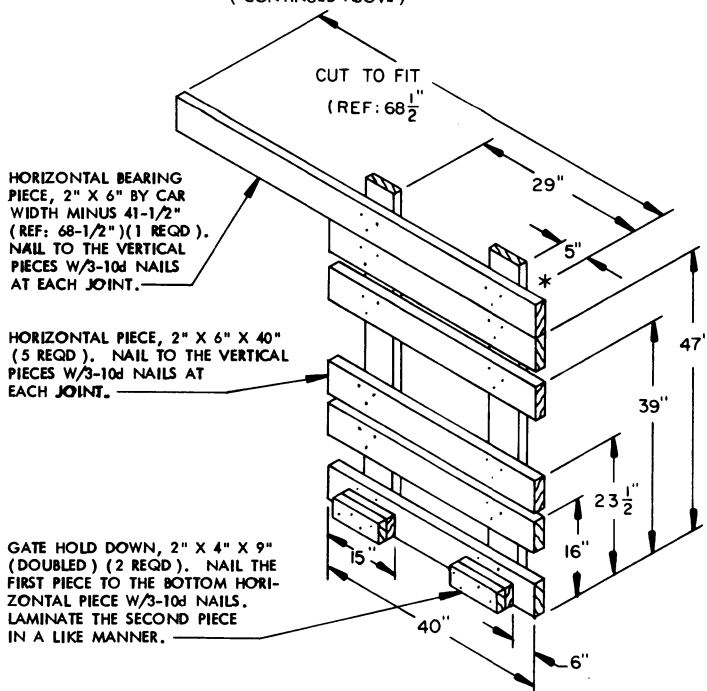
SPECIAL NOTES:

- A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
- 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.
- 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.
- ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO PAGE 4 OR 6 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

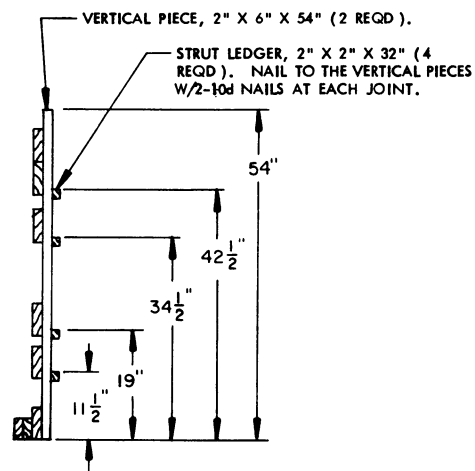
(CONTINUED ABOVE)

KEY NUMBERS

- ALTERNATIVE PLYWOOD SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 47.
- 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.
- ANTI-SWAY BEARING PIECE, 2" X 6" X 66" (1 REQD).
- FILLER PIECE, 2" X 6" X 41-1/2" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ③, W/3-10d NAILS.
- STRUT, 4" X 4" X 38-1/2" (8 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.

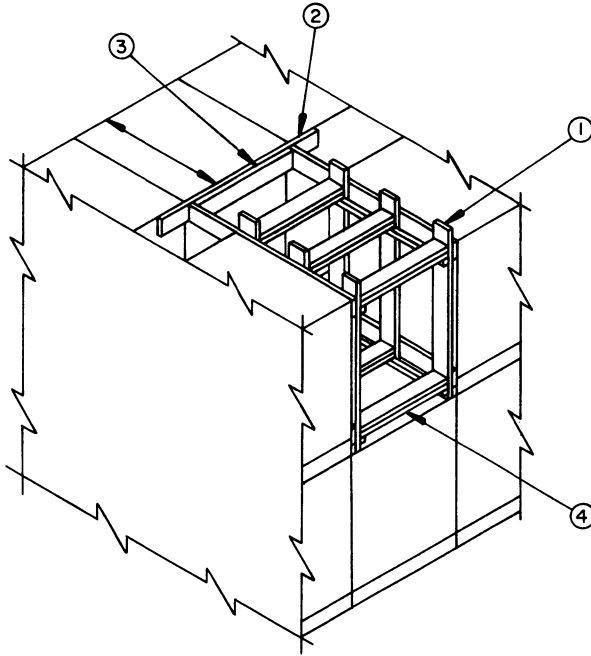


LOAD BEARING GATE A



END VIEW

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



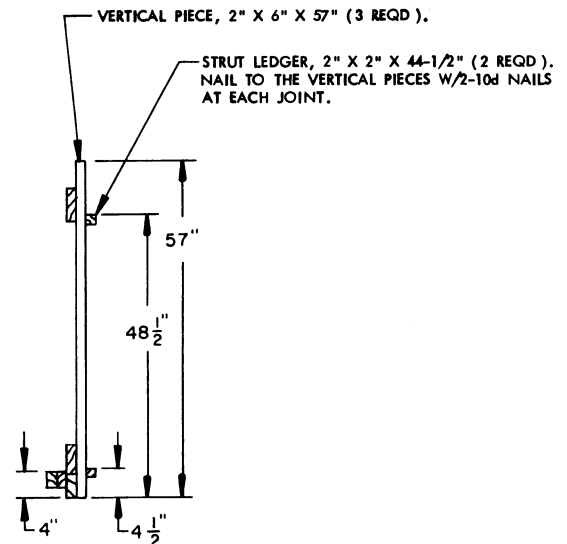
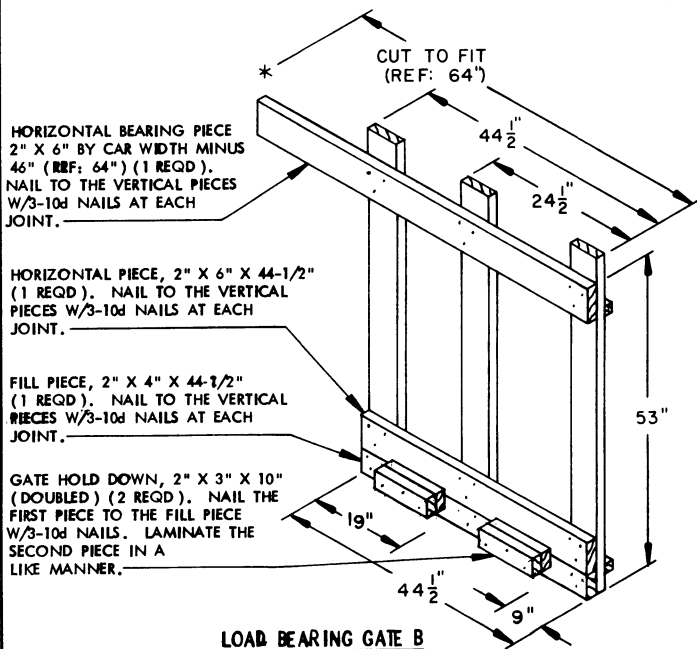
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS 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 PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO PAGE 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.

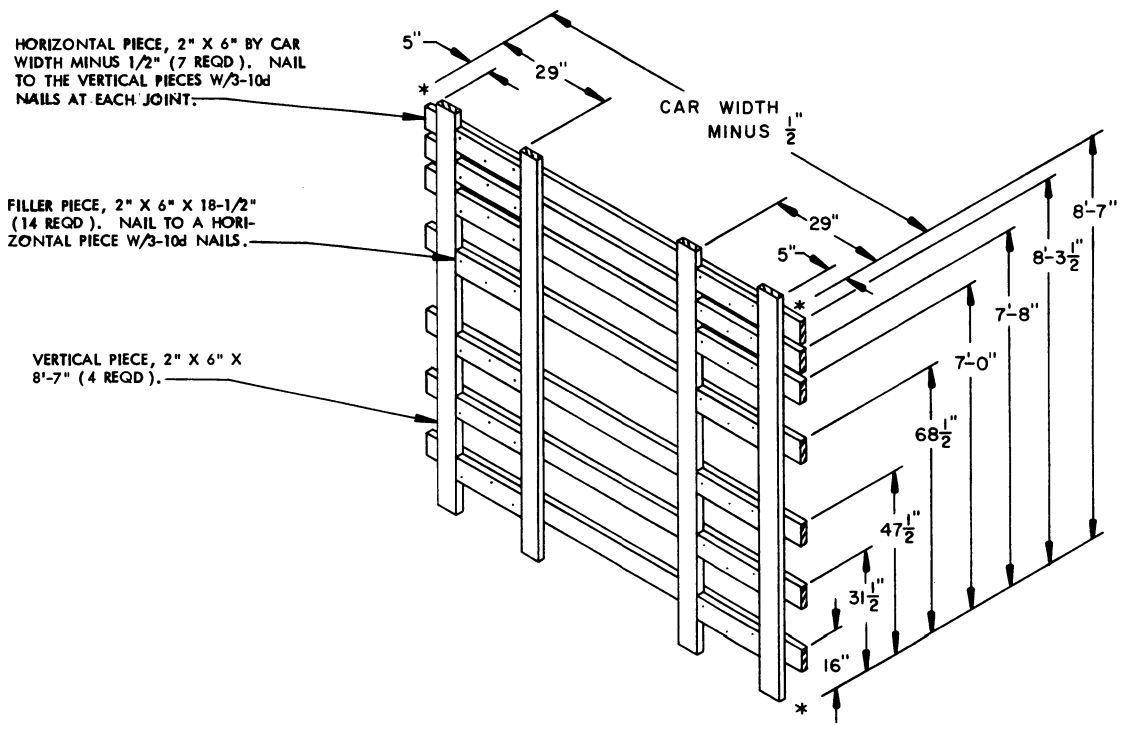
KEY NUMBERS

- ① LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE B" DETAIL BELOW. NAIL TO THE FILLER PIECE, PIECE MARKED ③, W/3-10d NAILS.
- ② ANTI-SWAY BEARING PIECE, 2" X 6" X 60" (1 REQD).
- ③ FILLER PIECE, 2" X 6" X 37" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ②, W/5-10d NAILS.
- ④ STRUT, 2" X 6" X 34" (DOUBLED) (6 REQD). LAMINATE W/6-10d NAILS. TOENAIL THE TOP PIECE TO THE VERTICAL PIECE OF THE LOAD BEARING GATE, PIECE MARKED ① W/2-12d NAILS AT EACH END.



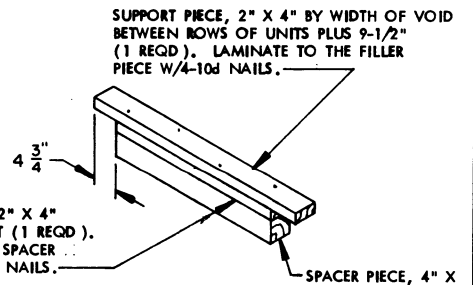
END VIEW

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



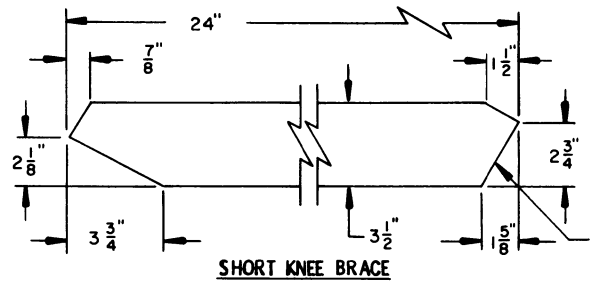
KNEE-BRACE GATE

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 22 AND IS IDENTIFIED THEREIN AS PIECE MARKED ④.

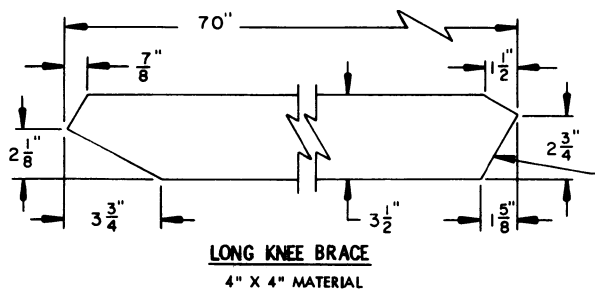


SPACER ASSEMBLY C

THIS ASSEMBLY IS FOR USE IN THE LOAD ON PAGE 22 AND IS IDENTIFIED THEREIN AS PIECE MARKED ⑦.

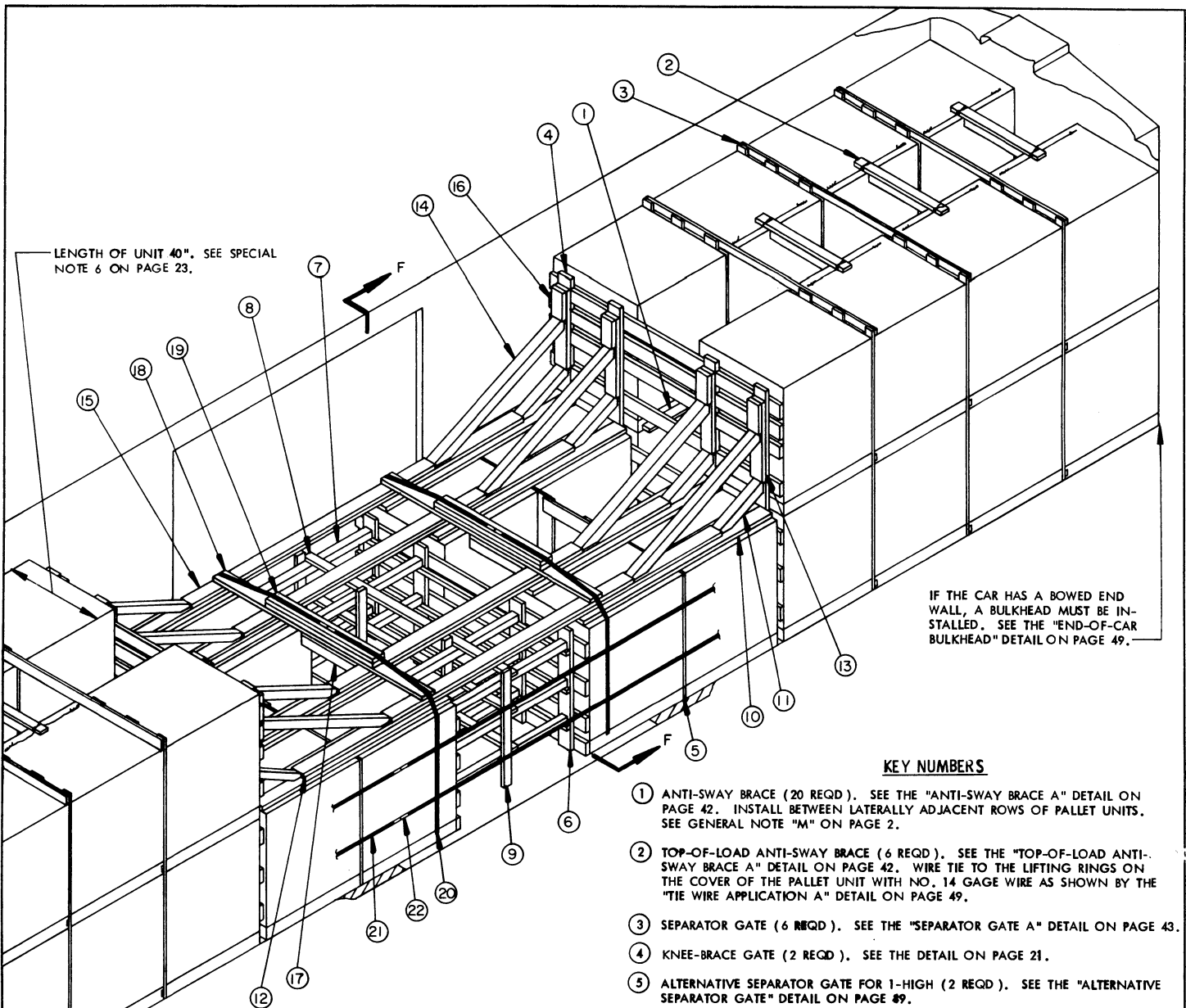


THE BRACE MUST BE INSTALLED SO THAT THIS BEARING SURFACE WILL BE IN CONTACT WITH THE VERTICAL PIECE OF THE KNEE BRACE GATE.



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

DETAILS

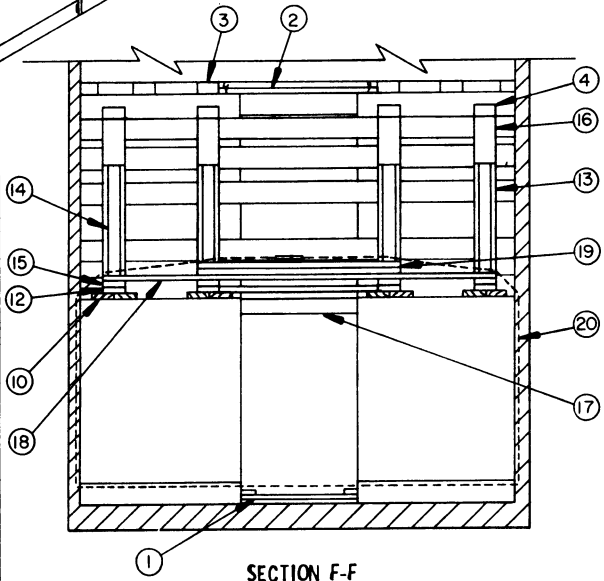


IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 49.

KEY NUMBERS

- ① ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49.
- ③ SEPARATOR GATE (6 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43.
- ④ KNEE-BRACE GATE (2 REQD). SEE THE DETAIL ON PAGE 21.
- ⑤ ALTERNATIVE SEPARATOR GATE FOR 1-HIGH (2 REQD). SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 49.
- ⑥ CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 43.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 54") (12 REQD). TOENAIL TO THE CENTER GATES, PIECES MARKED ⑥, W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON PAGE 23.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 9'-0" (3 REQD). NAIL TO THE STRUTS, PIECES MARKED ⑦, W/3-10d NAILS AT EACH JOINT.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" X 49" (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 24" (9 REQD). SEE THE "SHORT KNEE BRACE" DETAIL ON PAGE 21 FOR DIMENSIONS OF BEVEL CUTS. TOENAIL TO PIECES MARKED ④ AND ⑩ W/2-16d NAILS AT EACH END.
- ⑫ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT BETWEEN PIECES MARKED ⑪ (REF: 16'-6") (4 REQD). NAIL TO EACH PIECE MARKED ⑩ W/1-10d NAIL EVERY 12".
- ⑬ HOLD-DOWN CLEAT, 2" X 6" X 36" (8 REQD). NAIL TO PIECE MARKED ④ W/12-10d NAILS.
- ⑭ LONG KNEE BRACE, 4" X 4" X 70" (8 REQD). SEE THE "LONG KNEE BRACE" DETAIL ON PAGE 21 FOR DIMENSIONS OF BEVEL CUTS. TOENAIL TO PIECES MARKED ⑫ AND ⑬ W/2-16d NAILS AT EACH END.

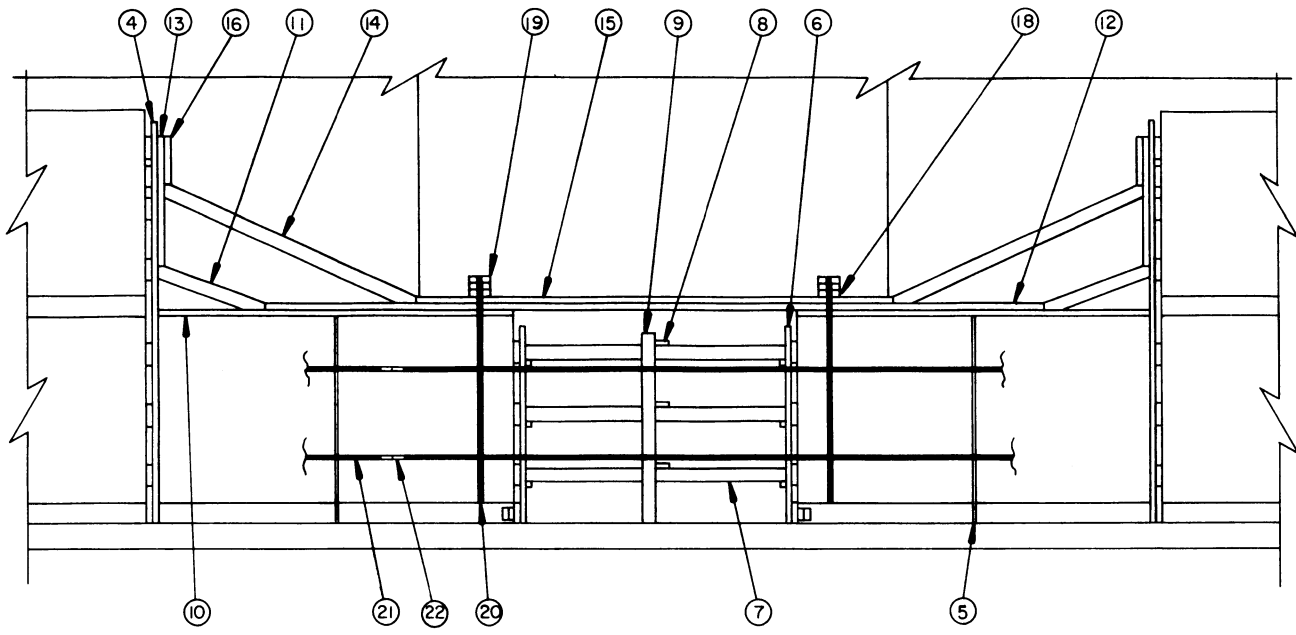
ISOMETRIC VIEW



SECTION F-F

(CONTINUED ON PAGE 23)

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



(KEY NUMBERS CONTINUED)

PARTIAL ELEVATION VIEW

- 15 BACK-UP CLEAT, 2" X 6" BY CUT TO FIT BETWEEN PIECES MARKED 14 (REF: 9'-9" (4 REQD). NAIL TO PIECE MARKED 12 W/1-10d NAIL EVERY 6".
- 16 HOLD DOWN CLEAT, 2" X 6" X 12" (8 REQD). NAIL TO PIECE MARKED 13 W/5-16d NAILS.
- 17 SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 21. NAIL TO PIECES MARKED 10 W/2-10d NAILS AT EACH END.
- 18 CROSS CAR BRACE, 2" X 6" X CAR WIDTH MINUS 10" (2 REQD). NAIL TO PIECES MARKED 15 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 21" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO PIECE MARKED 18 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 30'-0" LONG (REF) STEEL STRAPPING (2 REQD). INSTALL SO AS TO ENCIRCLE THE PALLET UNITS, CROSS CAR BRACE, AND STRAPPING BOARD. STAPLE TO STRAPPING BOARD W/3 STAPLES AND TO THE CROSS BRACE W/1 STAPLE AT EACH END.
- 21 DOORWAY STRAP, 1-1/4" X .035" OR .031" X 14'-0" LONG STEEL STRAPPING (4 REQD). INSTALL FROM TWO (2) 7'-0" LONG PIECES. SEE SPECIAL NOTE 4 AT RIGHT.
- 22 SEAL FOR 1-1/4" STEEL STRAPPING (20 REQD, 4 PER DOORWAY STRAP; 2 PER HOLD-DOWN STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" 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 OTHER WIDTH 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.
3. A MINIMUM OF TWO (2) SETS OF SPACER ASSEMBLIES, CROSS BRACES, STRAPPING BOARDS, AND HOLD-DOWN STRAPS, PIECES MARKED 17 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 9 ON PAGE 6, AND SPECIAL NOTE 11 ON PAGE 7. NOTE THAT THE HOLD-DOWN STRAPS, PIECES MARKED 20, WILL ALSO PROVIDE FOR DOORWAY PROTECTION IF DOORWAY BLOCKING AS SHOWN BY THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 55 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 SHOWN ON PAGE 55.
5. IF DESIRED, DOUBLED 2" X 6" STRUTS MAY BE USED IN LIEU OF THE DEPICTED 4" X 4" STRUTS, PIECES MARKED 7. LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TOP PIECE TO GATES W/2-12d NAILS AT EACH END.
6. NOTICE: THE UPPER-LAYER KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR A LOAD HAVING THE CONTAINERS ON THE PALLET UNITS POSITIONED LENGTHWISE IN THE CAR.

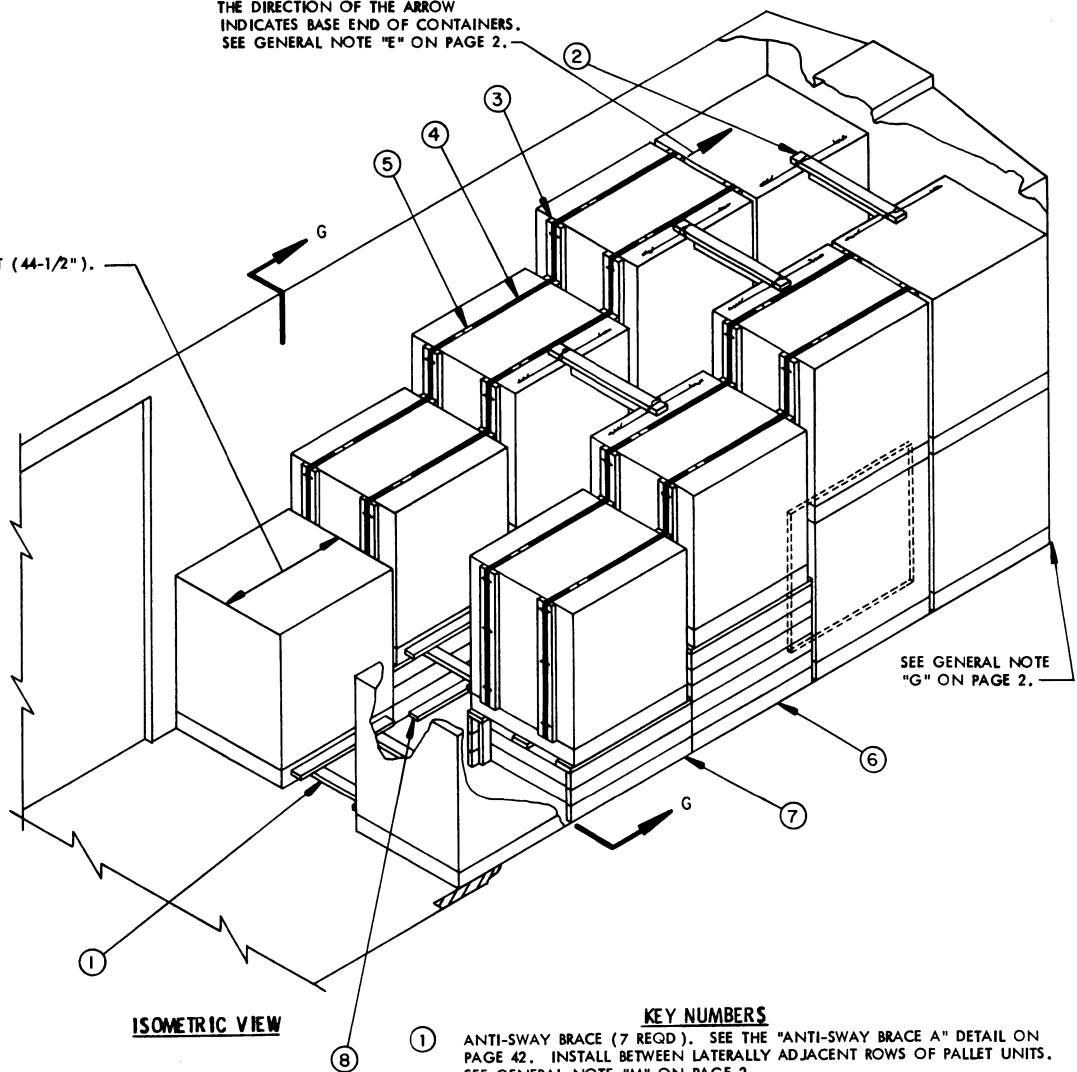
BILL OF MATERIAL		
LUMBER	LINEAR FEET	POUNDS
1" X 2"	55	10
1" X 3"	37	10
1" X 4"	173	58
1" X 6"	221	111
2" X 2"	50	17
2" X 4"	322	215
2" X 6"	650	650
4" X 4"	122	163
NAILS	NO. REQD	POUNDS
6d (2")	294	1-3/4
10d (3")	976	15-1/4
12d (3-1/4")	46	1
16d (3-1/2")	176	4
PLYWOOD, 1/2" -----	64 SQ FT REQD -----	88 LBS
STAPLES -----	6 REQD -----	NIL
WIRE, NO. 14 GAGE -----	60' REQD -----	NIL
STEEL STRAPPING, 1-1/4" X .035" OR .031" - 60' REQD --		9 LBS
SEAL FOR 1-1/4" STRAPPING ---	20 REQD -----	1 LB

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	40 -----	95,640 LBS
DUNNAGE -----		2,588 LBS
TOTAL WEIGHT-----		98,228 LBS (APPROX)

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

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

WIDTH OF UNIT (44-1/2").

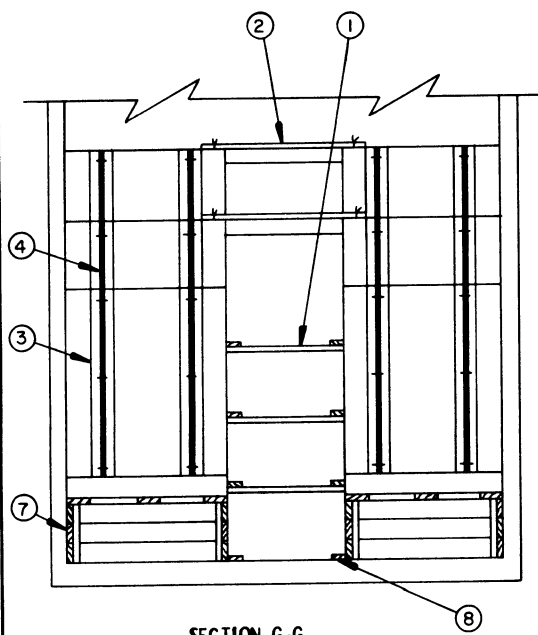


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

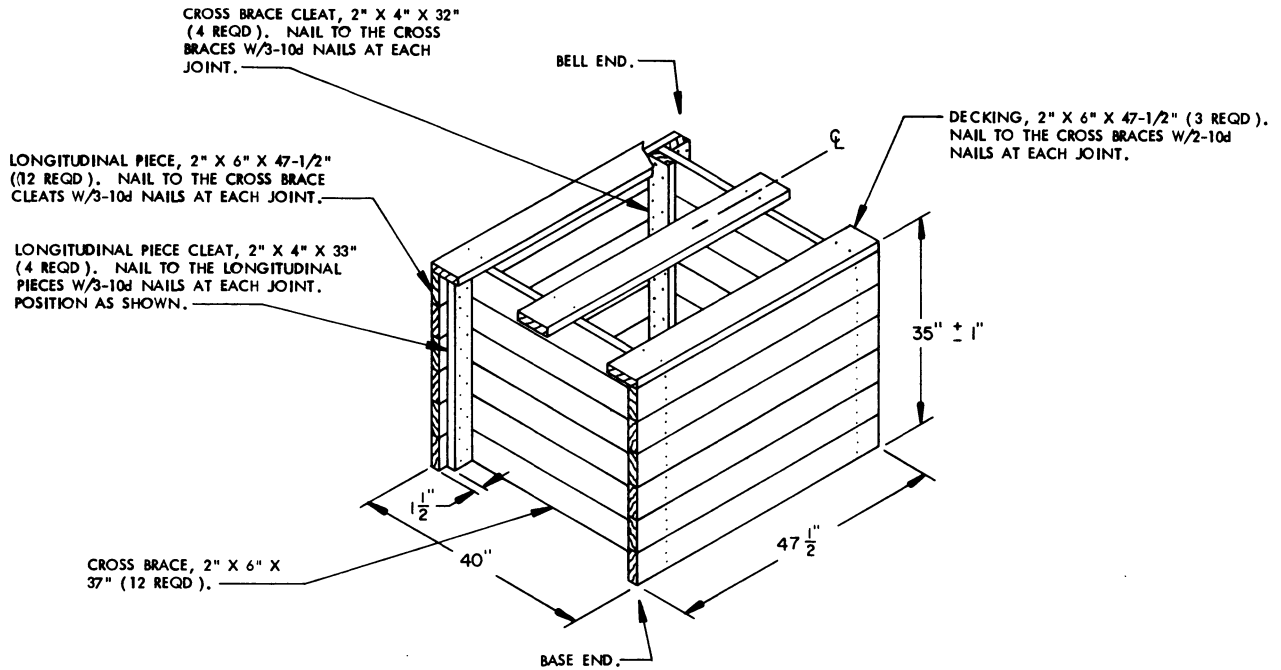
KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49.
- ③ STRAPPING BOARD, 2" X 6" X 46" (32 REQD/4 PER PALLET UNIT). POSITION SO AS TO BE CENTERED ON THE OUTER TWO STACKS OF CONTAINERS.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 17'-6" LONG (REF) STEEL STRAPPING (16 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 (32 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 25.
- ⑦ RISER ASSEMBLY (2 REQD). SEE THE "RISER ASSEMBLY B" DETAIL ON PAGE 25.
- 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 G-G

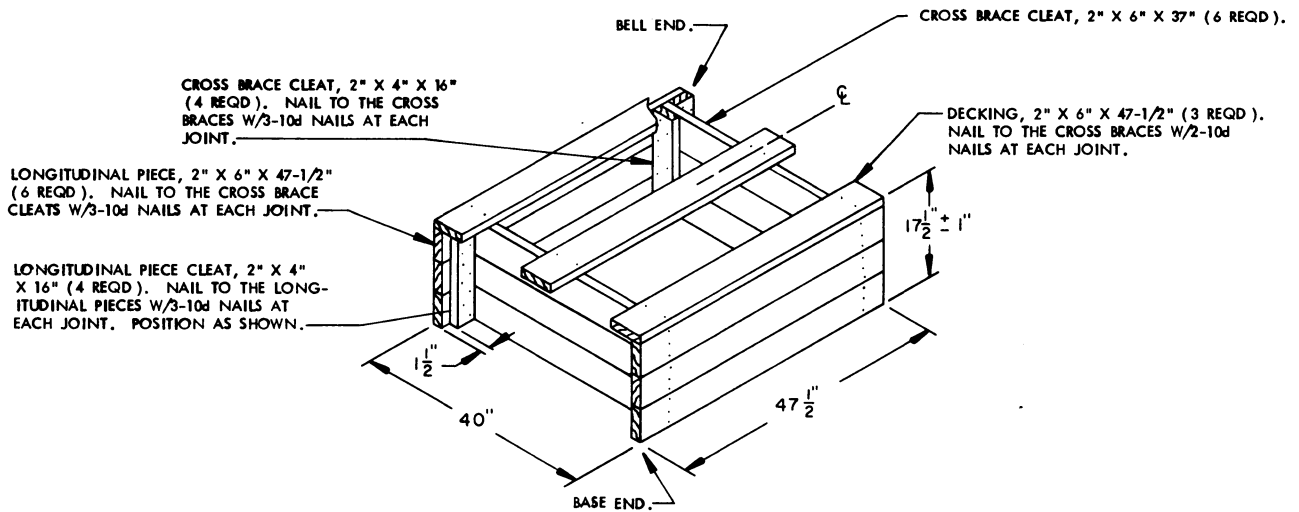
TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING



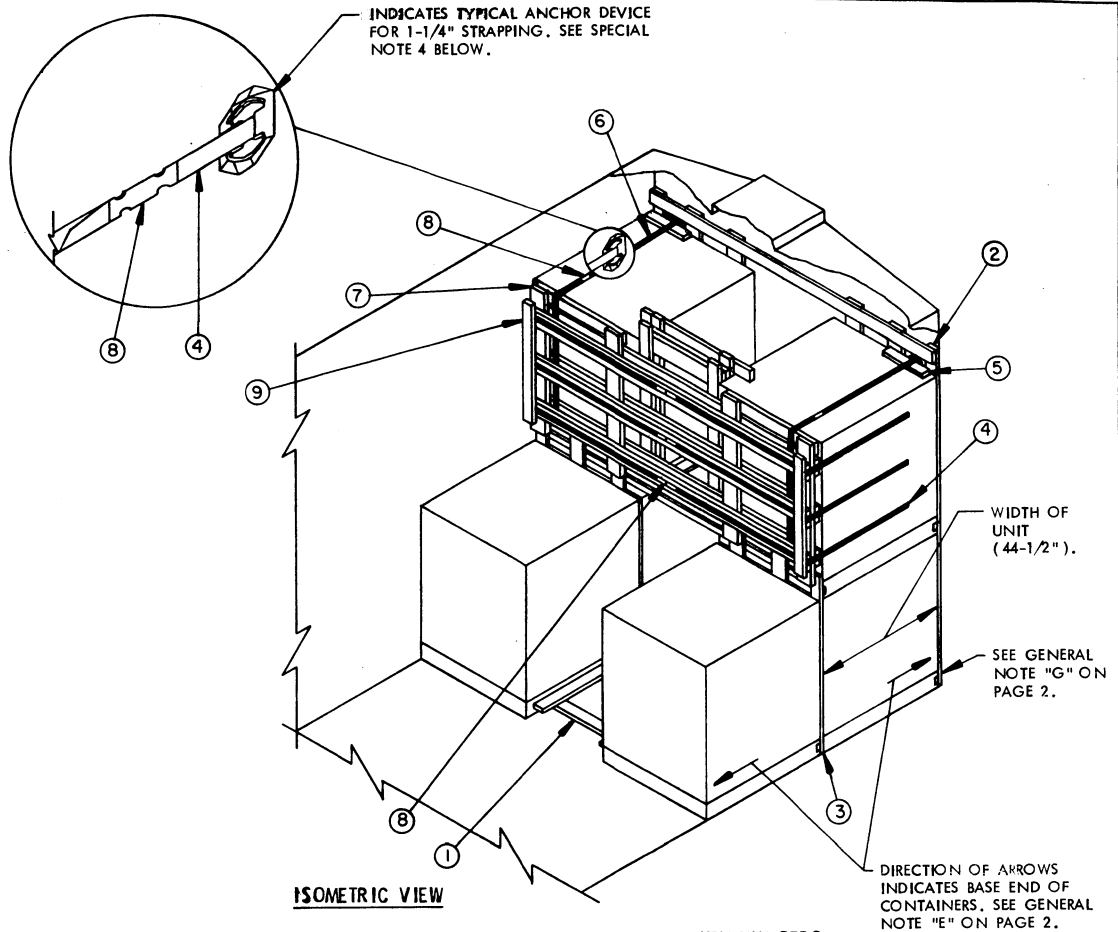
RISER ASSEMBLY A

SPECIAL NOTES FOR LOAD:

1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. 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. THE RISER METHOD WILL NOT BE USED WITHIN LOADS WHERE THE PALLET UNITS ARE POSITIONED CROSSWISE IN THE CAR.
3. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL LAYER BRACING IS SHOWN. REFER TO PAGE 4 OR 6 FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



RISER ASSEMBLY B



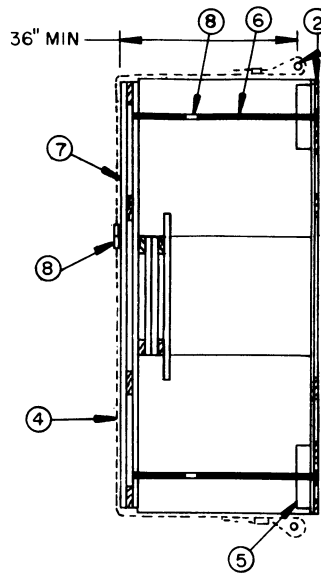
SPECIAL NOTES:

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. PARTIAL LAYERS OF CROSSWISE POSITIONED PALLET UNITS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,500 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 5,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS. A BULKHEAD GATE WITH 2 STRAPS WILL RETAIN 2 PALLET UNITS; A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN 3 PALLET UNITS.
4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 17 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 19 FOR A SINGLE UNIT.
5. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE ON PAGE 27 FOR THE LOCATION OF THE STRAPPING BOARDS IN RELATION TO THE LOCATION OF THE HORIZONTAL PIECES. THE STRAPPING BOARDS SHOULD BE LOCATED WITHIN THESE TOLERANCES. IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.

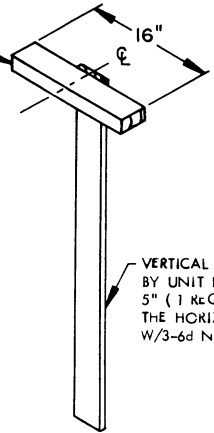
KEY NUMBERS

- ① ANTI-SWAY BRACE (3 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② SEPARATOR GATE FOR 2-HIGH LOAD (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR ENDWALL.
- ③ SEPARATOR GATE FOR 1-HIGH LOAD (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 43.
- ④ BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 27 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.
- ⑤ STRAPPING BOARD (2 REQD). SEE THE DETAIL ON PAGE 27.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" X 17'-6" LONG STEEL STRAPPING (2 REQD). PRE-POSITION TO ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE AND A STRAPPING BOARD, PIECE MARKED ⑤. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ④.
- ⑦ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 27. SEE SPECIAL NOTE 3 AT LEFT.
- ⑧ SEAL FOR 1-1/4" STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ④), AND 1 PER BUNDLING STRAP, PIECE MARKED ⑥. DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑨ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

INDICATES STRAP ANCHOR DEVICE.



HORIZONTAL PIECE,
2" X 4" X 16" (1
REQD).



VERTICAL PIECE, 1" X 6"
BY UNIT HEIGHT MINUS
5" (1 REQD). NAIL TO
THE HORIZONTAL PIECE
W/3-6d NAILS.

STRAPPING BOARD

STRAP APPLICATION PLAN VIEW

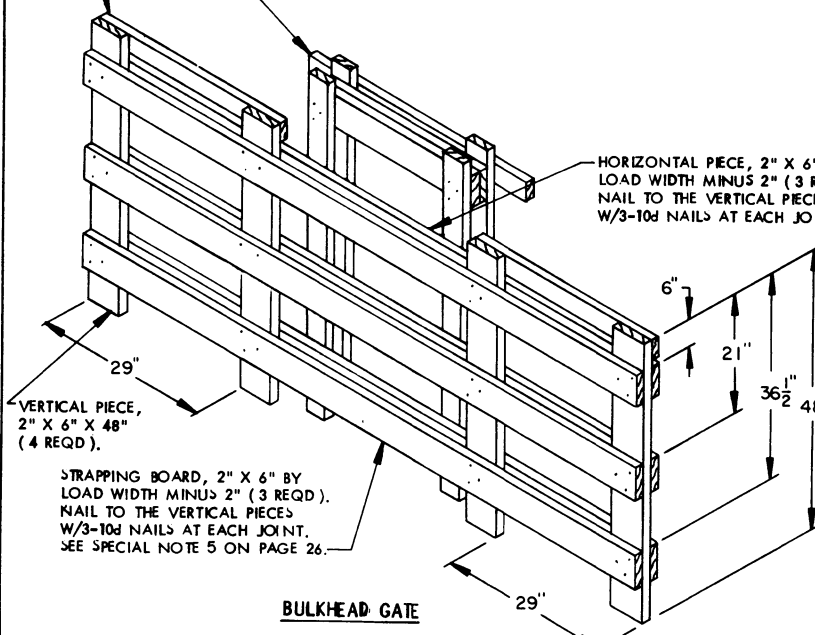
THE ANTI-SWAY BRACE, PIECE MARKED ①, HAS BEEN OMITTED FOR CLARITY.

HORIZONTAL PIECE, 2" X 4" X 34-1/2"
(2 REQD). NAIL TO THE VERTICAL
PIECES W/3-10d NAILS AT EACH END.

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

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

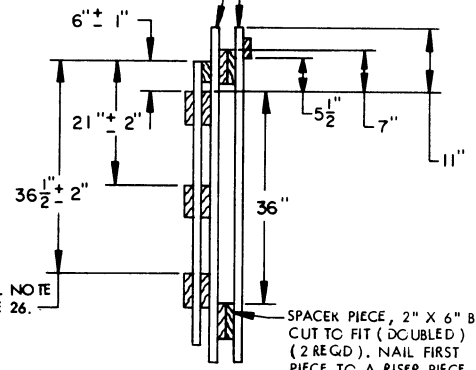
RISER PIECE, 2" X 4" X 57"
(4 REQD). NAIL TO THE
HORIZONTAL PIECES AND/OR
THE SPACER PIECES W/3-10d
NAILS AT EACH JOINT.



VERTICAL PIECE,
2" X 6" X 48"
(4 REQD).

STRAPPING BOARD, 2" X 6" BY
LOAD WIDTH MINUS 2" (3 REQD).
NAIL TO THE VERTICAL PIECES
W/3-10d NAILS AT EACH JOINT.
SEE SPECIAL NOTE 5 ON PAGE 26.

BULKHEAD GATE

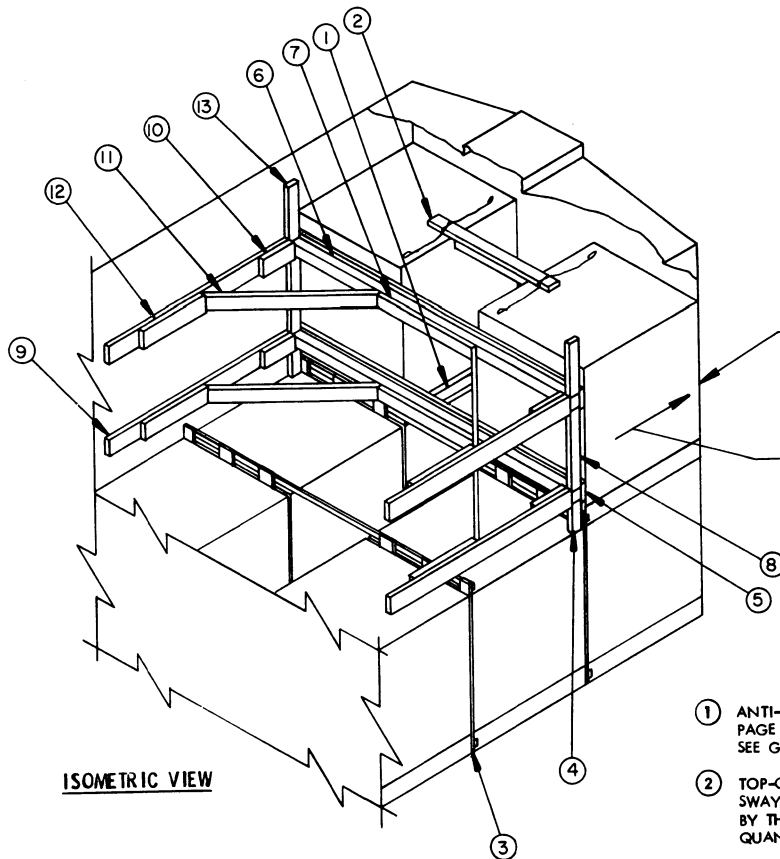


SEE SPECIAL NOTE
5 ON PAGE 26.

SPACER PIECE, 2" X 6" BY
CUT TO FIT (DOUBLED)
(2 REQD). NAIL FIRST
PIECE TO A RISER PIECE
W/3-10d NAILS AT EACH
JOINT. LAMINATE SECOND
PIECE TO THE FIRST W/6-10d
NAILS.

END VIEW

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



ISOMETRIC VIEW

IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 49.

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

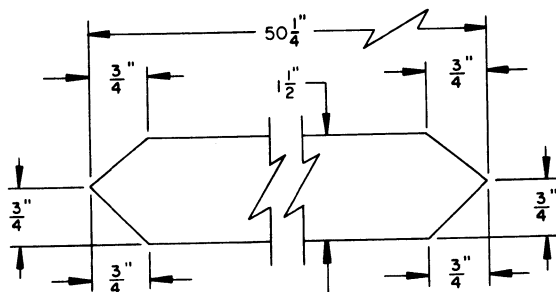
KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42. 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 "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49. 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 43. SEE SPECIAL NOTE 5 BELOW.
- ④ SUPPORT CLEAT, 2" X 4" X 10-1/2" (2 REQD). FOR LENGTHWISE LOADED PALLET UNITS, POSITION VERTICALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. FOR CROSSWISE LOADED PALLET UNITS, POSITION HORIZONTALLY 1" ABOVE THE LOWER PALLET UNIT. 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 27-1/2" FOR A LENGTHWISE LOAD, 2" X 4" X 39" FOR A CROSSWISE LOAD (2 REQD). NAIL TO THE 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. A LENGTHWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CROSSWISE LOADS. NOTE THAT FOR A CROSSWISE PARTIAL TIER, THE PIECES MARKED ⑤ MUST BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNIT BASE AND COVER. THE SUPPORT PIECE, PIECE MARKED ④, MUST BE POSITIONED HORIZONTALLY INSTEAD OF VERTICALLY AS SHOWN, AND PIECE MARKED ⑧ WILL BE 39" LONG IN LIEU OF 27-1/2". ADDITIONALLY, ANTI-SWAY BRACE "B" WILL BE USED IN LIEU OF ANTI-SWAY BRACE "A", PIECE MARKED ①. SEE THE DETAIL ON PAGE 44. WIRE TIE ANTI-SWAY BRACE "B" TO A PALLET POST TO PREVENT DISPLACEMENT. FOR A 1-UNIT PARTIAL SECOND 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 PAGE 29, 30, OR 31 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 TWO (2) 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.

(CONTINUED AT RIGHT)



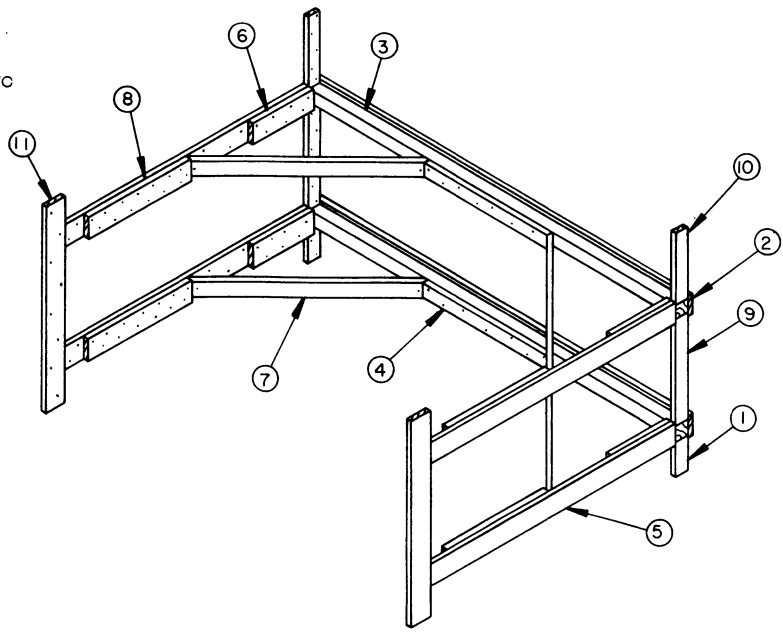
DIAGONAL BRACE

(SPECIAL NOTE 5 CONTINUED)

5. THE SEPARATOR GATE DIRECTLY UNDER THE K-BRACE MUST BE CONSTRUCTED USING A 1" X 2" OR 1" X 3" TOP TIE PIECE IN ORDER TO FIT BETWEEN THE WINGS OF THE PALLETS. IN LIEU OF DOING THAT, A PLYWOOD GATE MAY BE USED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 49.

SPECIAL NOTES:

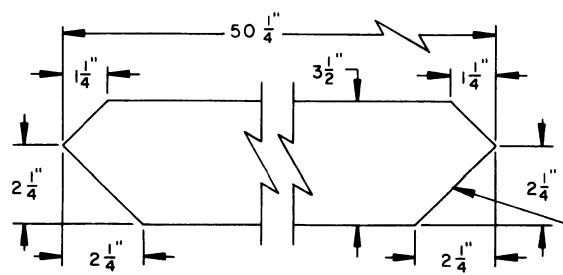
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN SIX (6) PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN SIX PALLET UNITS, REFER TO THE DETAILS ON PAGES 30 AND 31 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THIS BRACE. IF ONLY TWO PALLET UNITS ARE TO BE SHIPPED IN THE PARTIAL LAYER, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 MAY BE USED.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 28 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10-1/2" (2 REQD). FOR LENGTHWISE LOADED PALLET UNITS, POSITION VERTICALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. FOR CROSSWISE LOADED PALLET UNITS, POSITION HORIZONTALLY 1" ABOVE THE LOWER PALLET UNIT. 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 27-1/2" FOR A LENGTHWISE LOAD, 2" X 4" X 39" 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.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

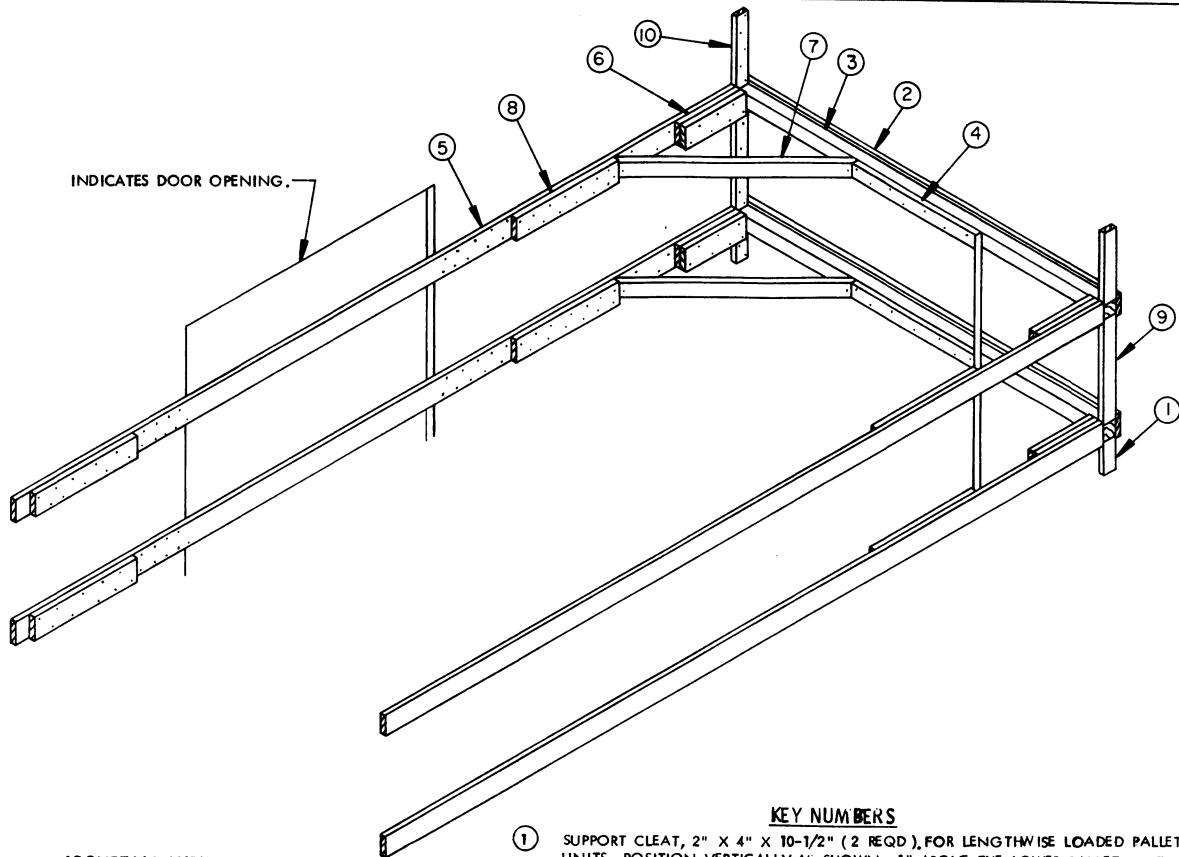


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPICAL LCL USING K-BRACE METHOD



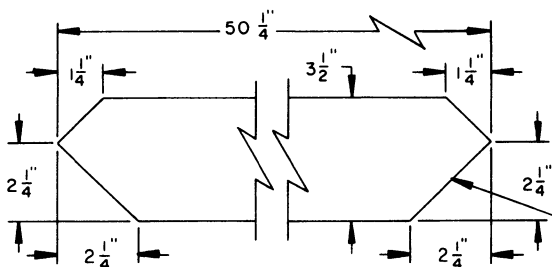
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPE "C" K BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN EIGHT (8) PALLET UNITS. IF IT IS NECESSARY TO BLOCK MORE THAN EIGHT PALLET UNITS, REFER TO THE DETAIL ON PAGE 31 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED IS ONLY SIX PALLET UNITS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER IS ONLY ONE OR TWO PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, 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 26" 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.

KEY NUMBERS

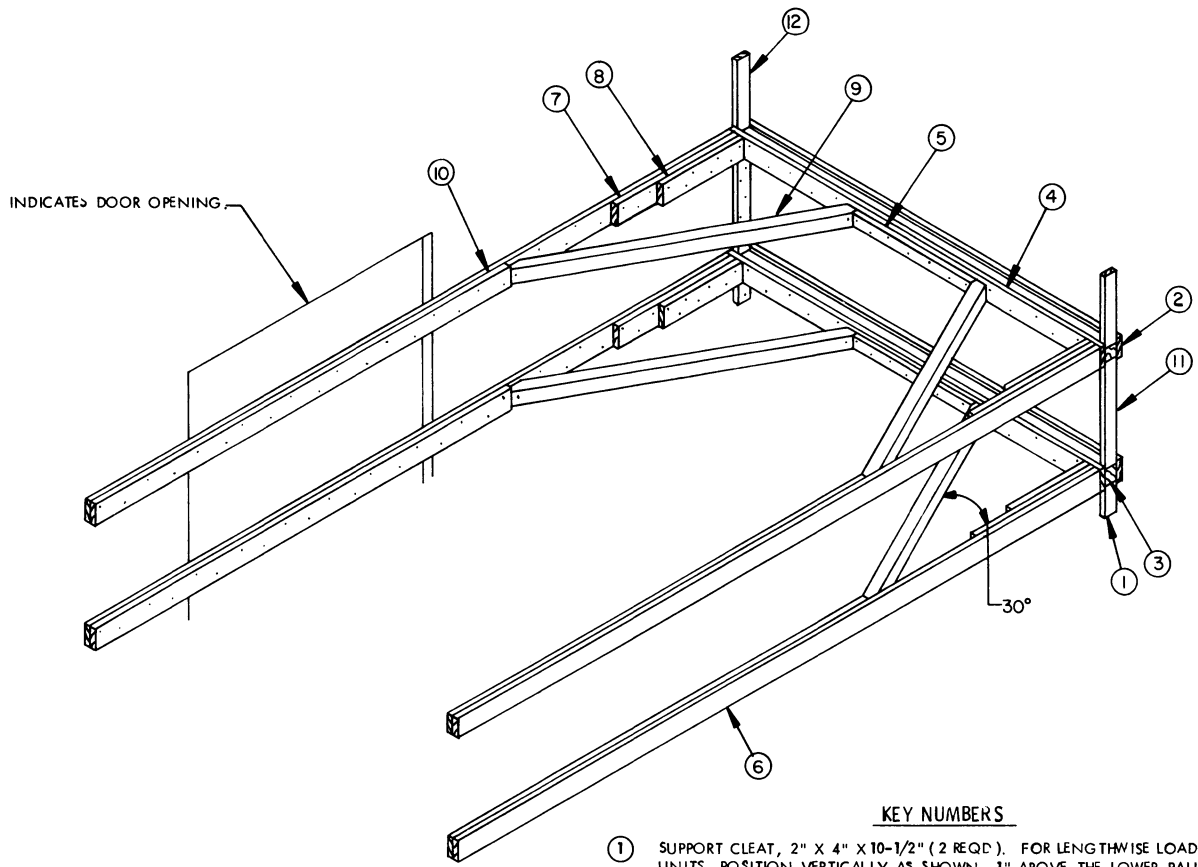
- ① SUPPORT CLEAT, 2" X 4" X 10-1/2" (2 REQD), FOR LENGTHWISE LOADED PALLET UNITS, POSITION VERTICALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. FOR CROSSWISE LOADED PALLET UNITS, POSITION HORIZONTALLY 1" ABOVE THE LOWER PALLET UNIT. NAIL TO THE CAR SIDEWALL W/3-12d NAILS.
- ② LOAD BEARING PIECE, 2" 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 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ④ 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 27-1/2" FOR A LENGTHWISE LOAD, 2" X 4" X 39" 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.



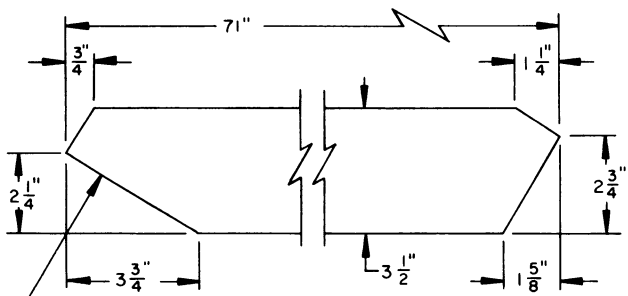
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10-1/2" (2 REQD). FOR LENGTHWISE LOADED PALLET UNITS, POSITION VERTICALLY AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT. FOR CROSSWISE LOADED PALLET UNITS, POSITION HORIZONTALLY 1" ABOVE THE LOWER PALLET UNIT. 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 OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.
- ⑪ SPACER CLEAT, 2" X 4" X 27-1/2" FOR A LENGTHWISE LOAD, 2" X 4" X 39" FOR A CROSSWISE LOAD (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.

SPECIAL NOTE:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN TEN (10) PALLET UNITS. IF THE PARTIAL TIER TO BE BRACED IS ONLY EIGHT PALLET UNITS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 30 MAY BE USED. IF FOUR OR SIX PALLET UNITS ARE TO BE SHIPPED, THE TYPE "B" K-BRACE DEPICTED ON PAGE 29 MAY BE USED. IF THE PARTIAL TIER IS ONLY ONE OR TWO PALLET UNITS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 28 WILL BE ADEQUATE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALLRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

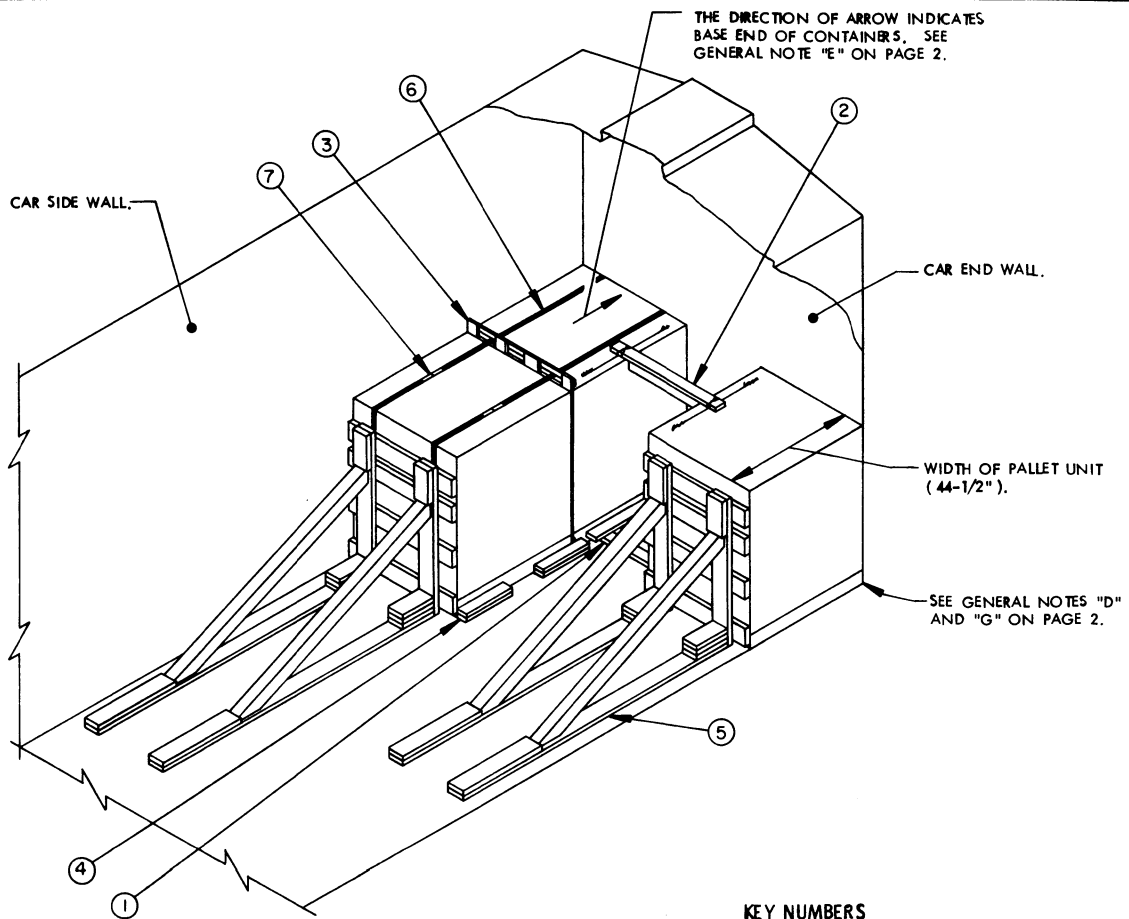


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "D" K-BRACE



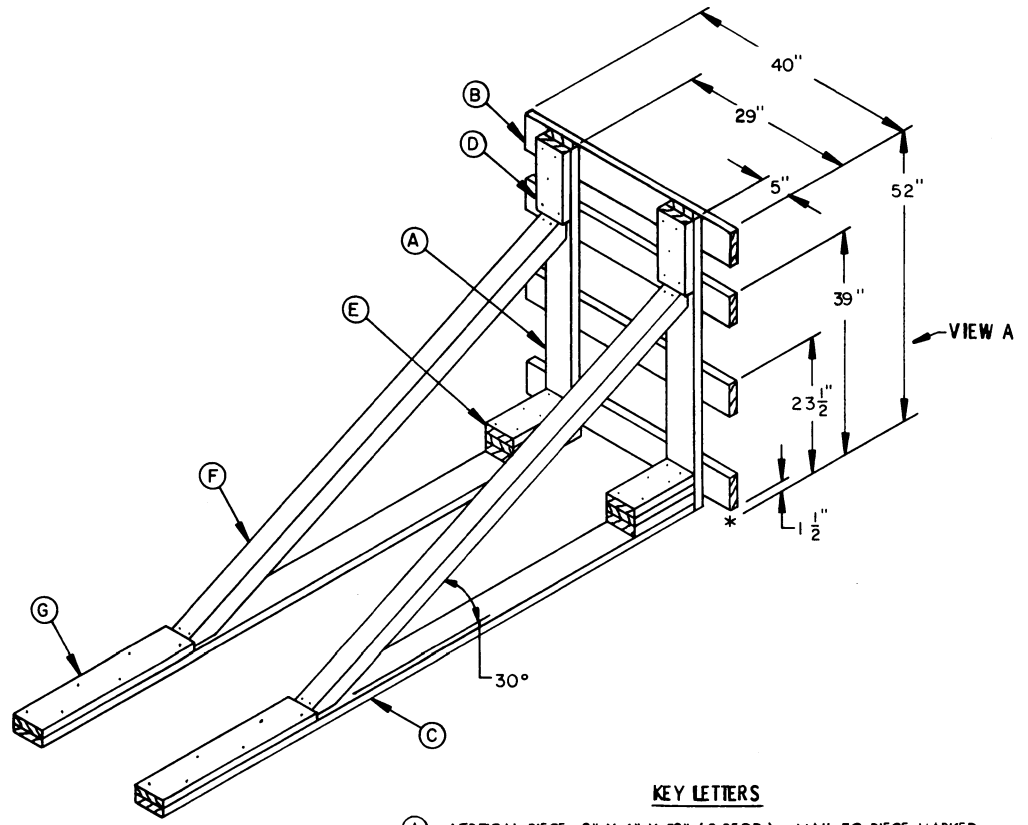
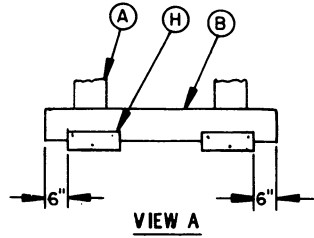
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (1 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 42.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 42. WIRE TIE TO THE LIFTING RINGS ON THE COVER OF THE PALLET UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 49.
- ③ SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 45. 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.
- ⑤ KNEE BRACE ASSEMBLY (2 REQD). SEE THE "KNEE BRACE ASSEMBLY" DETAIL ON PAGE 33.
- ⑥ BUNDLING STRAP, 1-1/4" X .035" OR .031" X 17'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION. 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.

SPECIAL NOTES:

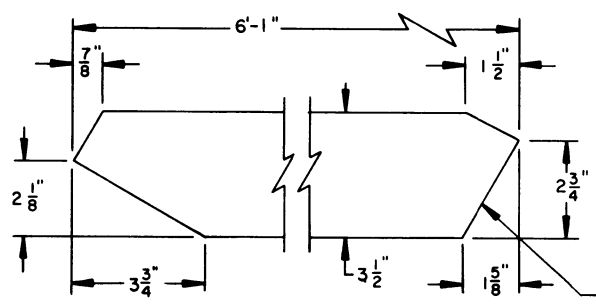
- 1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR AVAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
- 2. THE KNEE BRACE METHOD OF LCL BRACING IS ONLY APPLICABLE FOR THE BRACING OF PALLET UNITS POSITIONED LENGTHWISE IN THE CAR; KNEE BRACING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



ISOMETRIC VIEW

KEY LETTERS

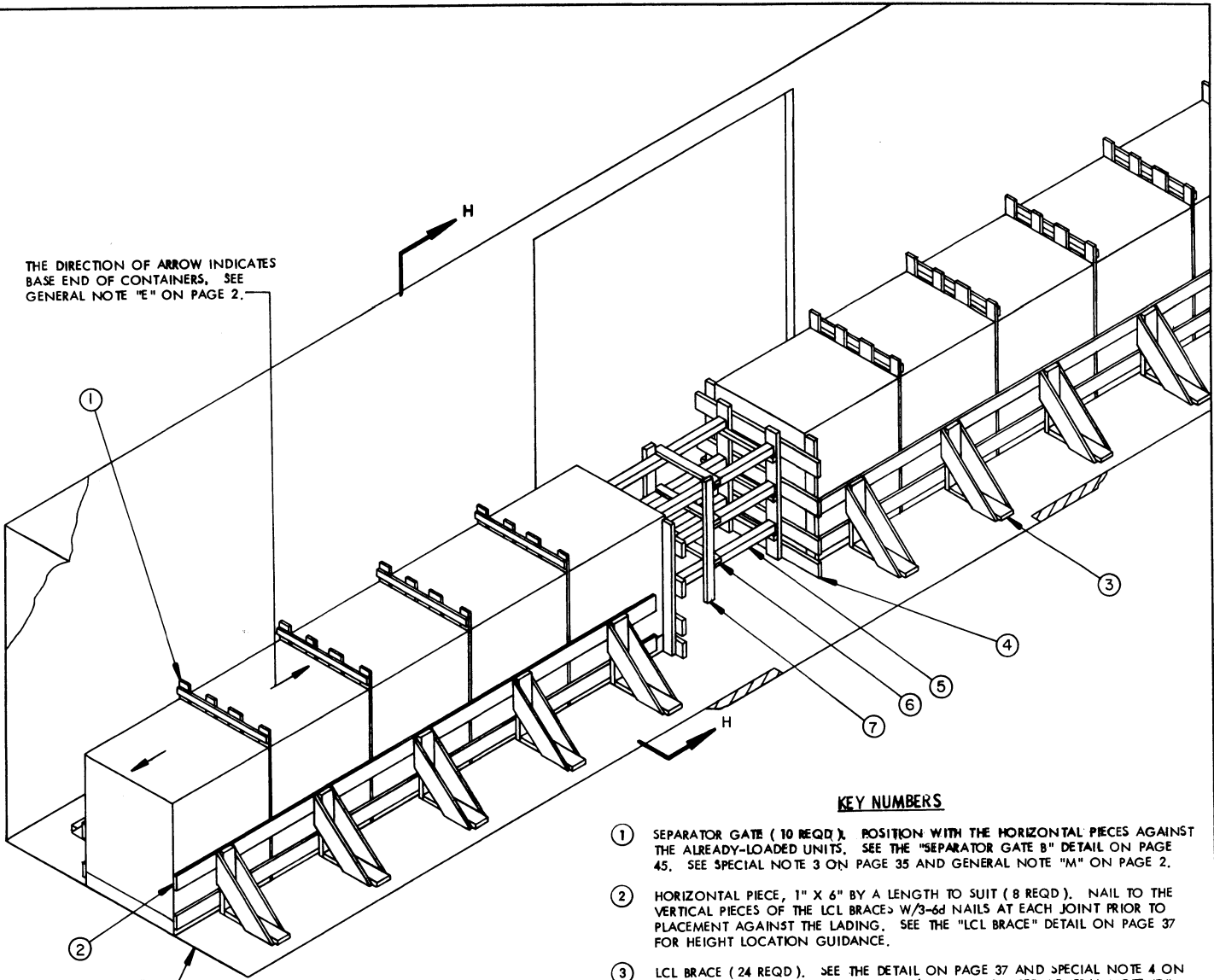
- (A) VERTICAL PIECE, 2" X 6" X 52" (2 REQD). NAIL TO PIECE MARKED (B) W/3-16d NAILS.
- (B) HORIZONTAL PIECE, 2" X 6" X 40" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "M" ON PAGE 2.
- (C) FLOOR CLEAT, 2" X 6" X 8'-0" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "R" ON PAGE 2.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 14" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.
- (F) BRACE, 4" X 4" X 6'-1" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH END.
- (G) BACK-UP CLEAT, 2" X 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.

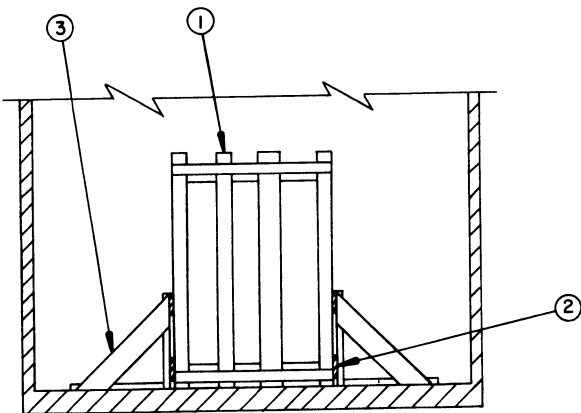


SEE GENERAL NOTE
"G" ON PAGE 2.

ISOMETRIC VIEW

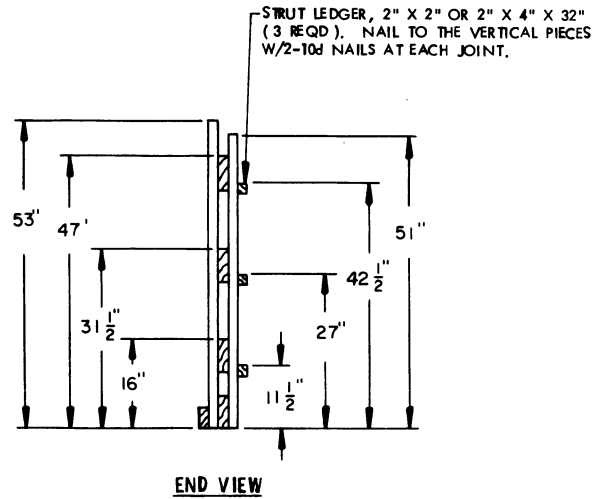
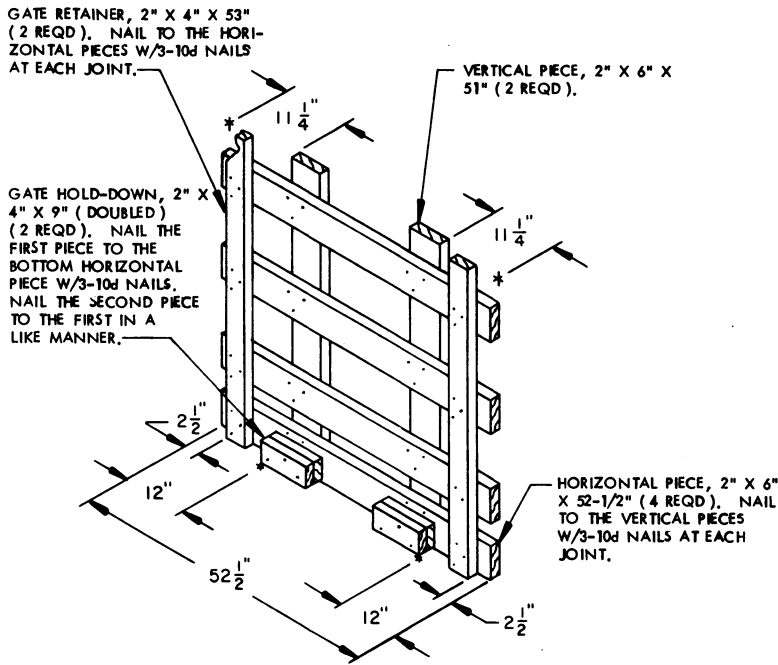
KEY NUMBERS

- ① SEPARATOR GATE (10 REQD). POSITION WITH THE HORIZONTAL PIECES AGAINST THE ALREADY-LOADED UNITS. SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 45. SEE SPECIAL NOTE 3 ON PAGE 35 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 BRACE> W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 37 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE (24 REQD). SEE THE DETAIL ON PAGE 37 AND SPECIAL NOTE 4 ON PAGE 35. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "R" ON PAGE 2.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 35. SEE SPECIAL NOTES 2 AND 3 ON PAGE 35.
- 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 35.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" X 32" (3 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤ , W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "T" ON PAGE 2.
- ⑦ VERTICAL STRUT BRACING, 2" X 4" X 48" (2 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑤ , W/3-10d NAILS AT EACH JOINT.



SECTION H-H

TYPICAL LCL LOAD USING A 1-WIDE LOADING METHOD



CENTER GATE G

FOR 50'-6" CAR, LENGTHWISE LOAD

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. IF A 15-UNIT LOAD IS BEING SHIPPED IN A 60'-8" LONG CAR, CENTER GATE "H" WILL BE USED IN LIEU OF CENTER GATE "G", AND EIGHT (8) STRUTS WILL BE REQUIRED INSTEAD OF SIX (6). SEE THE "CENTER GATE "H" DETAIL ON PAGE 36.
3. ONE-WIDE LOADING PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE LOADS. ELEVEN (11) PALLET UNITS CAN BE LOADED IN A 40'-6" LONG CAR, FOURTEEN (14) CAN BE LOADED IN A 50'-6" LONG CAR, AND SEVENTEEN (17) CAN BE LOADED IN A 60'-8" LONG CAR. THE SEPARATOR GATES WILL NOT BE REQUIRED. CENTER GATE "J" WITH SIX (6) 4" X 4" STRUTS WILL BE USED FOR 40'-6" AND 50'-6" LONG CARS; CENTER GATE "J" WITH SIX (6) DOUBLED 2" X 6" STRUTS WILL BE USED IN A 60'-8" LONG CAR. LAMINATE W/1-10d NAIL EVERY 6" AND TOENAIL THE TOP PIECE W/2-12d NAILS AT EACH END. SEE THE "CENTER GATE J" DETAIL ON PAGE 36.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. FOR CROSSWISE PALLET UNITS, THE BRACES WILL BE CENTERED ON THE LENGTH OF THE UNIT. FOR THE LENGTHWISE UNITS, THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE UNIT WIDTH, WITH SLIGHT ADJUSTMENTS AS NECESSARY TO ALIGN A BRACE WITH THE CENTER COLLAR OF THE CONTAINERS.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT POSITIONING AND THEREFORE ARE ONLY TYPICAL.

BILL OF MATERIAL (TYPICAL)

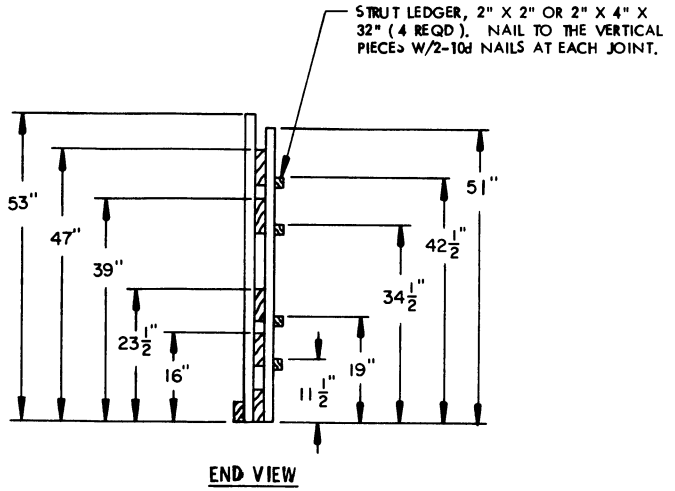
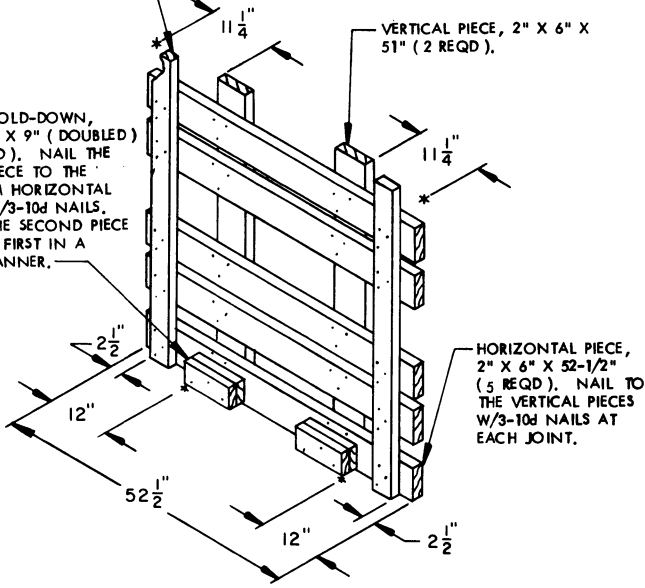
LUMBER	LINEAR FEET	BOARD FEET
1" X 3"	66	17
1" X 4"	148	50
1" X 6"	465	233
2" X 2"	8	3
2" X 4"	38	26
2" X 6"	149	149
4" X 4"	29	39
NAILS	NO. REQD	POUNDS
6d (2")	384	2-1/2
8d (2-1/2")	288	3-1/4
10d (3")	180	3
16d (3-1/2")	72	1-3/4

LOAD AS SHOWN (TYPICAL)

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	12-----	28,692 LBS
DUNNAGE-----	-----	1,045 LBS
TOTAL WEIGHT-----		29,737 LBS (APPROX)

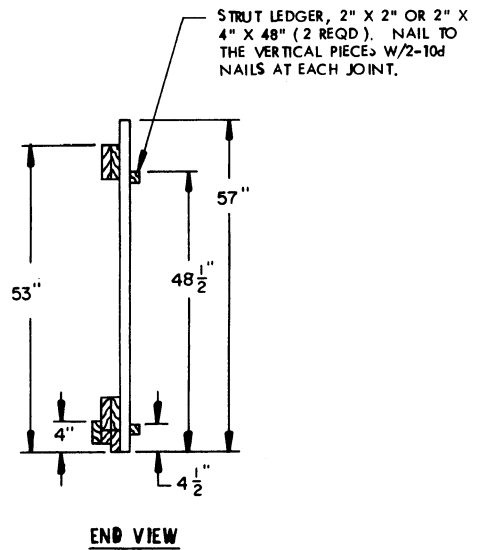
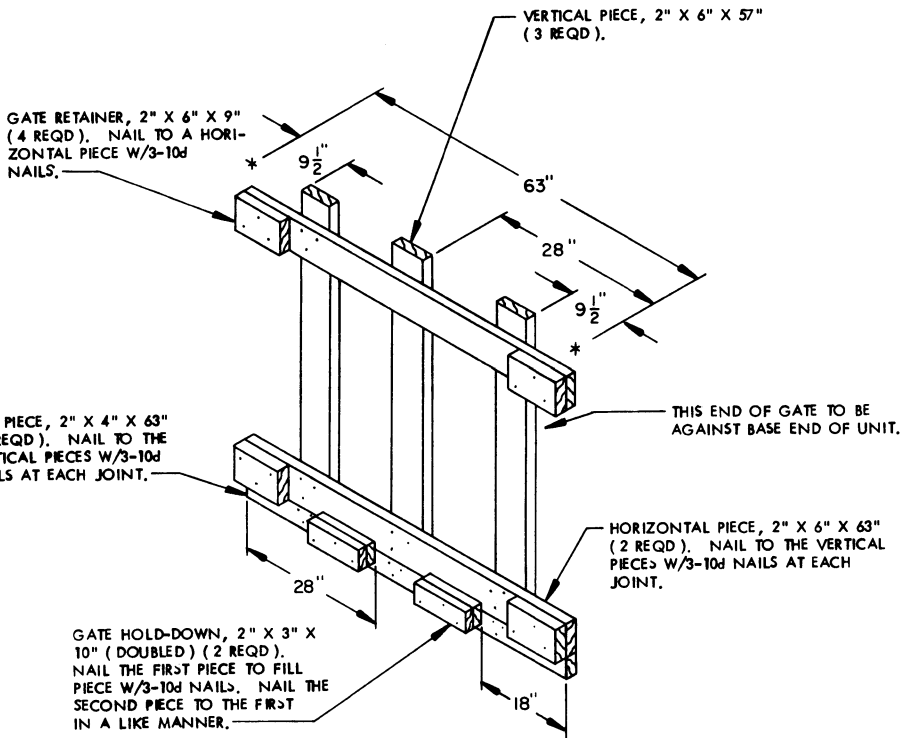
GATE RETAINER, 2" X 4" X 53"
(2 REQD). NAIL TO THE HORIZONTAL
PIECES W/3-10d NAILS
AT EACH JOINT.

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.



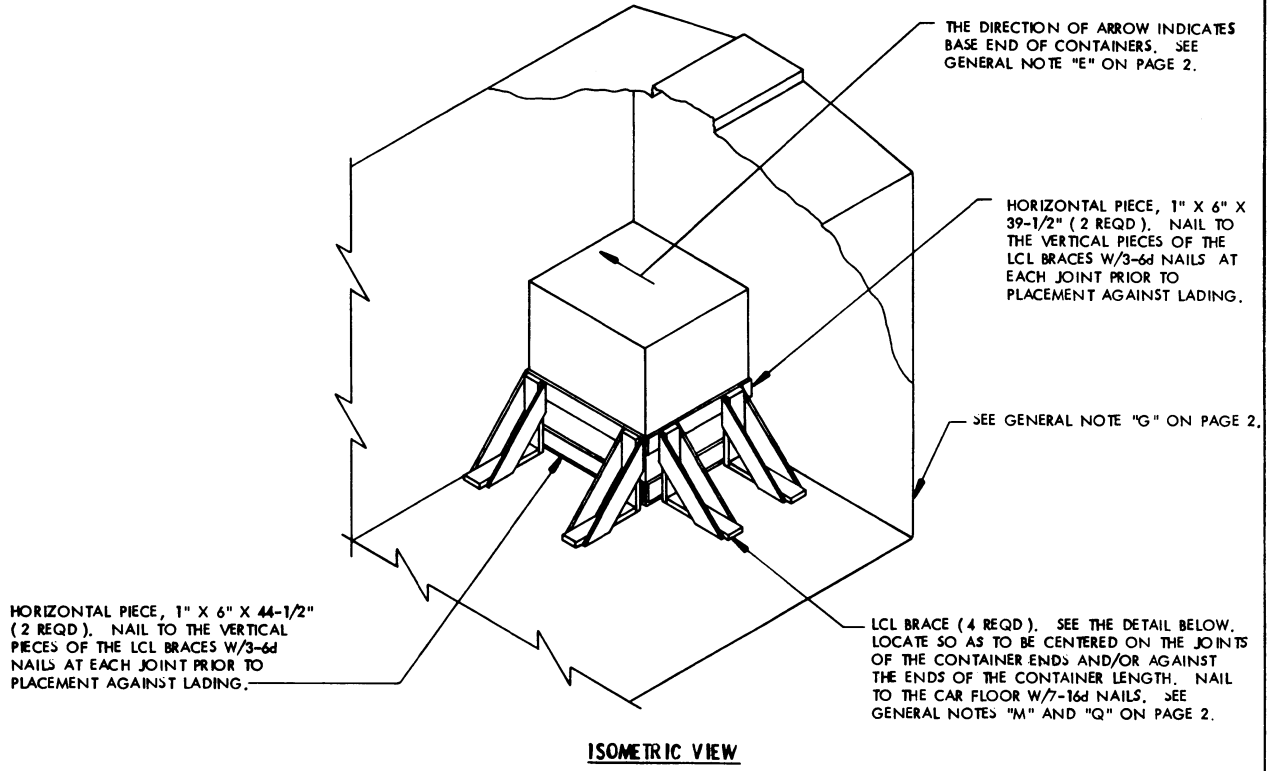
CENTER GATE H

FOR 60'-8" CAR, LENGTHWISE LOAD



CENTER GATE J

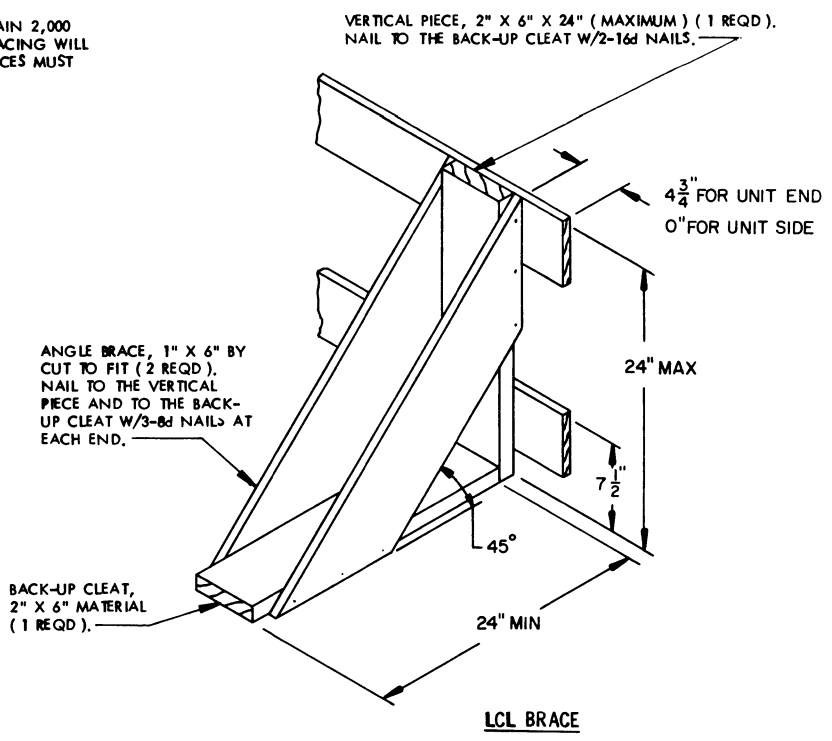
FOR CROSSWISE LOADS. ONE RIGHT
HAND AND ONE LEFT HAND GATE
REQUIRED.



ISOMETRIC VIEW

SPECIAL NOTES:

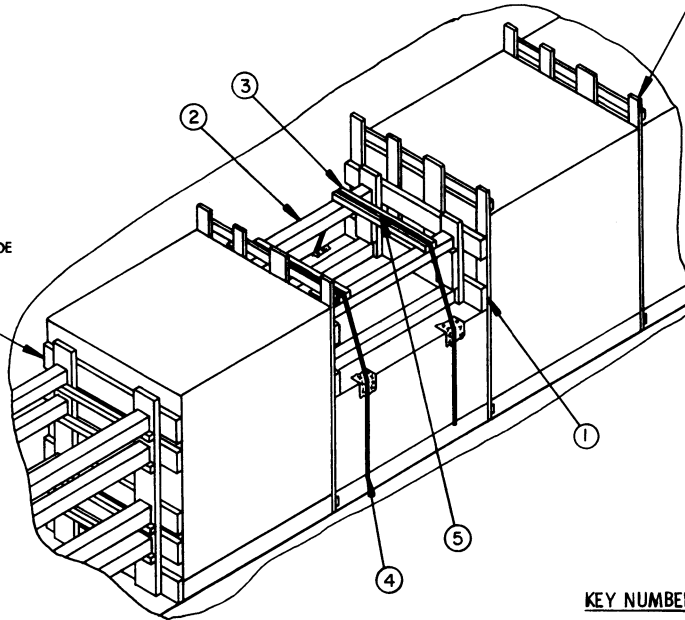
1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTES "D" AND "R" ON PAGE 2.
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A CROSSWISE UNIT IS SHOWN, HOWEVER, THE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



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

INDICATES CENTER GATE "A" IF PROCEDURES ARE FOR A 2-WIDE LOAD; CENTER GATE "D" IF FOR A 1-WIDE LOAD.

INDICATES SEPARATOR GATE "B" IF PROCEDURES ARE FOR A 1-WIDE LOAD; SEPARATOR GATE "A" IF FOR A 2-WIDE LOAD.



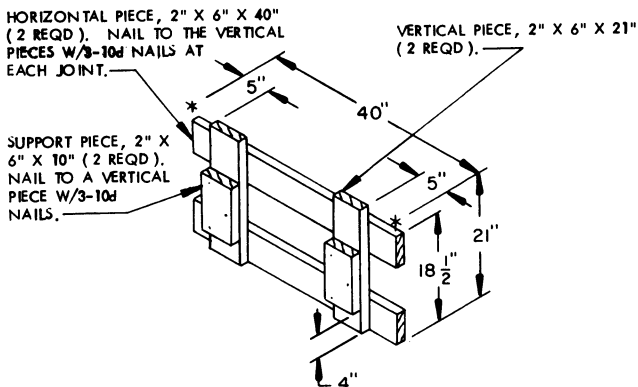
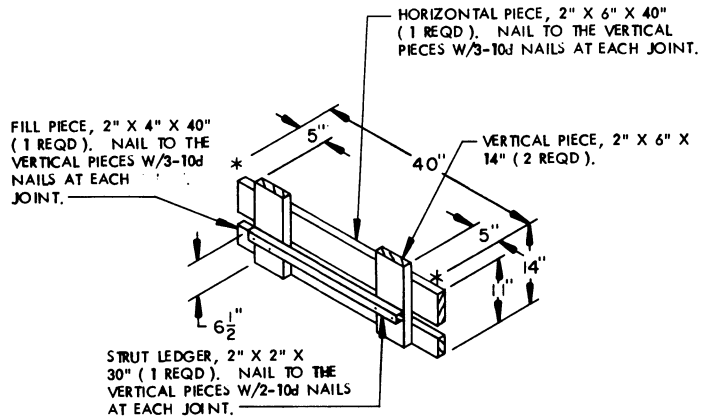
POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER

SPECIAL NOTES:

- 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 LENGTHWISE LOAD, THE PRINCIPLES MAY BE APPLIED FOR SHIPMENT OF A PARTIAL PALLET UNIT IN THE SECOND LAYER.
- A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN THREE (3) LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT 4 AND 5-LAYER PARTIAL UNITS. PARTIAL-UNIT GATE DETAILS ARE SHOWN FOR UNITS REDUCED BY ONE AND TWO LAYERS.
- A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FIVE (5) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY AS DETAILED BY DRAWING 19-48-4079/7B-20PM1000, MUST BE INSTALLED IN PLACE OF THE OMITTED CONTAINERS.
- THE FILLERS 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 ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES ITS DESTINATION.
- THE "POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

- 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.
- STRUT, 4" X 4" X 38-1/2" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED ①, W/2-10d NAILS AT EACH END.
- STRAPPING BOARD, 2" X 4" X 28" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- UNITIZING STRAP, 1-1/4" X .031" OR .035" X 16'-0" LONG STEEL STRAPPING (2 REQD). PRE-POSITION UNDER THE PALLET.
- SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.

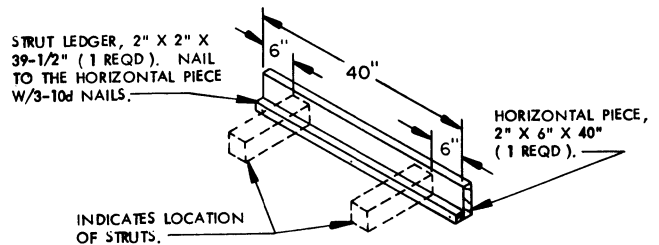


PARTIAL UNIT GATE A

FOR 3 CONTAINERS HIGH PARTIAL UNIT.

PARTIAL UNIT GATE B

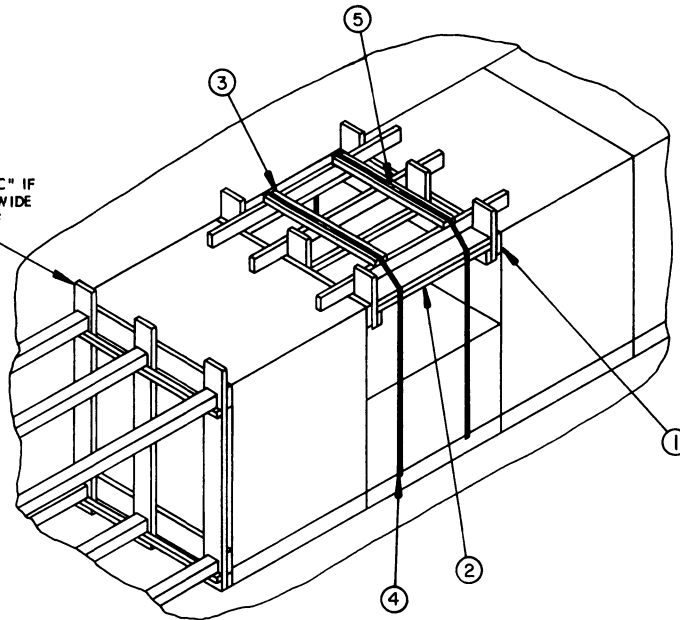
FOR 4-CONTAINERS HIGH PARTIAL UNIT



PARTIAL UNIT GATE C

FOR 5 CONTAINERS HIGH PARTIAL UNIT.

INDICATES CENTER GATE "C" IF PROCEDURES ARE FOR A 2-WIDE LOAD: CENTER GATE "F" IF FOR A 1-WIDE LOAD.



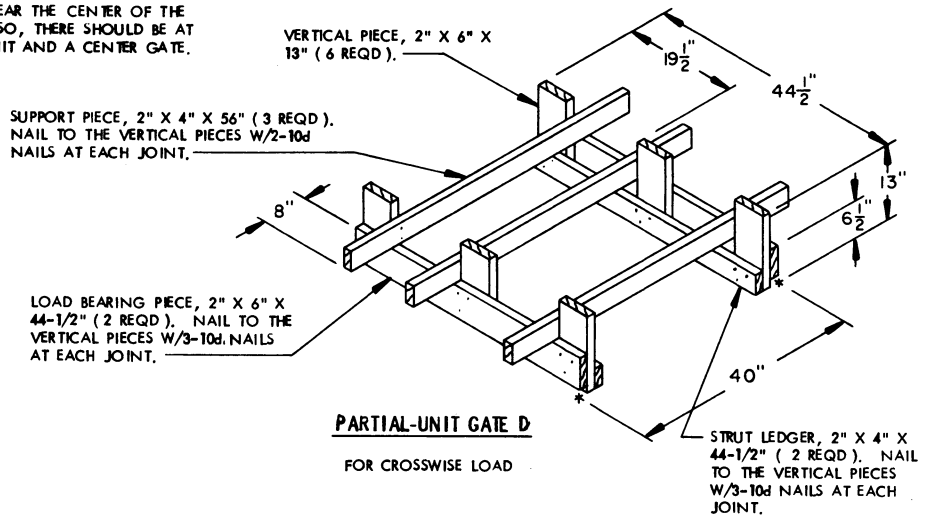
POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER

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 CROSSWISE 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 CROSSWISE-POSITIONED COMPLETE ROUNDS WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD WILL BE LIMITED TO NOT LESS THAN THREE (3) LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A LOAD. THE PROCEDURES ALSO APPLY TO SHIPMENTS OF 4 OR 5 LAYER PARTIAL UNITS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF FIVE (5) CONTAINERS, OR AN APPROVED FILL ASSEMBLY, AS DETAILED BY DRAWING 19-48-4079/7B-20PM1002, MUST BE INSTALLED IN PLACE OF THE OMITTED CONTAINER.
4. THE FILLERS 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 ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MUST BE REMOVED WHEN A SHIPMENT REACHES DESTINATION.
5. THE "POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 40 MUST BE USED IN LIEU OF THE ABOVE DEPICTED PROCEDURE. FOR SHIPMENT OF A 3-LAYER PARTIAL UNIT, THE PROCEDURES SHOWN ON PAGE 40 MAY BE MORE ECONOMICAL.
7. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

- ① PARTIAL-UNIT GATE (1 REQD.). SEE THE "PARTIAL-UNIT GATE D" DETAIL BELOW. SEE GENERAL NOTE "M" ON PAGE 2.
- ② STRUT, 2" X 6" X 34" (DOUBLED) (3 REQD.). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL THE TOP PIECE TO THE VERTICAL PIECES OF PIECE MARKED ① W/2-12d NAILS AT EACH END.
- ③ STRAPPING BOARD, 2" X 4" X 34" (2 REQD.). NAIL TO THE SUPPORT PIECES OF PIECE MARKED ① W/2-10d NAILS AT EACH JOINT.
- ④ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 17'-6" LONG STEEL STRAPPING (2 REQD.). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE PALLET.
- ⑤ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.

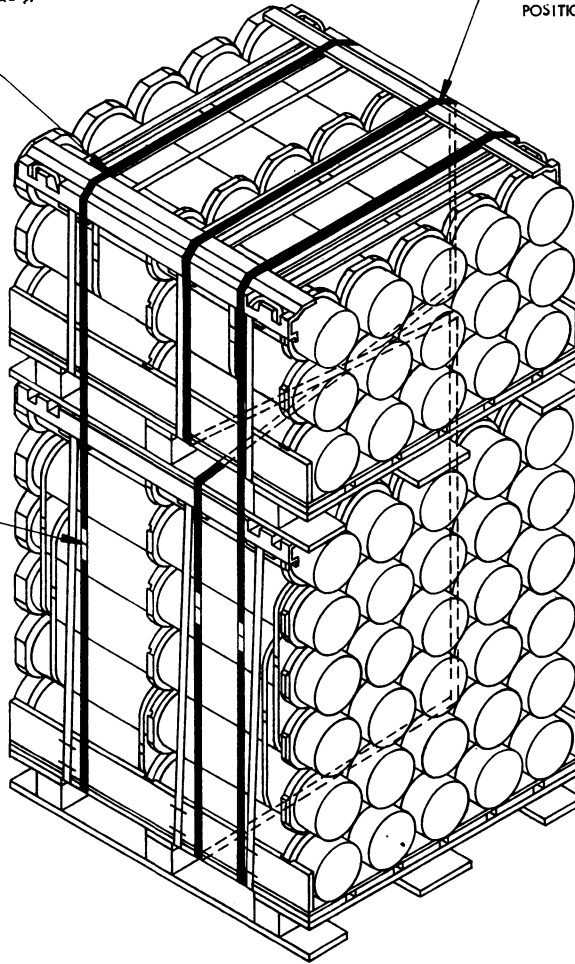


PROCEDURES FOR SHIPMENT OF PARTIAL UNITS CROSSWISE

VERTICAL UNITIZING STRAP, 1-1/4" X .031" OR .035"
BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD).
POSITION NEAR THE PALLET POSTS.

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

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



SECUREMENT OF PARTIAL UNIT ON TOP

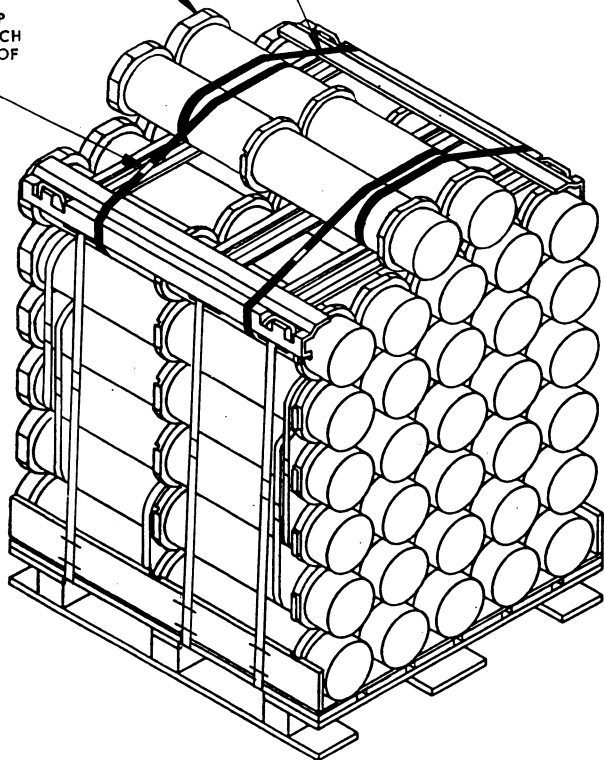
SPECIAL NOTE:

1. THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CROSSWISE LOAD.
CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN
THREE (3) LAYERS OF CONTAINERS. FOR SHIPMENT OF MORE THAN THREE
LAYERS OF CONTAINERS, OR AN ALTERNATIVE METHOD FOR ONE, TWO, OR
THREE LAYERS, REFER TO THE PROCEDURES ON PAGE 39.

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

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 14'-0" LONG STEEL STRAPPING (2 REQD). POSITION TO FORM A COMPLETE LOOP AROUND CONTAINERS.

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



SECUREMENT OF TWO CONTAINERS

SPECIAL NOTES:

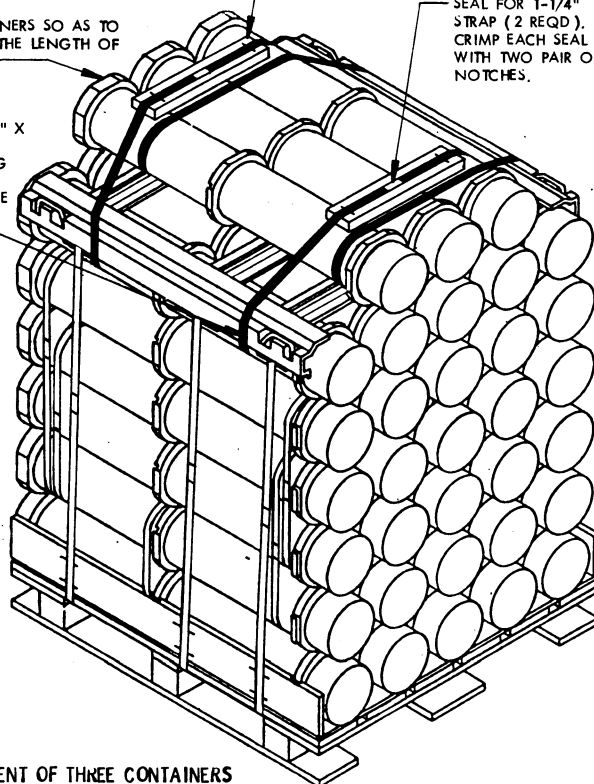
1. SHIPMENTS OF COMPLETE ROUNDS SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFT-OVER CONTAINERS. LEFT-OVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT EITHER ON TOP OF A LOAD AS SHOWN ON PAGE 40 OR WITHIN A LAYER AS SHOWN ON PAGES 38 AND 39.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION WOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED, BUT NOT IN THE DOORWAY.
4. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

STRAPPING BOARD, 1" X 4" X 16" FOR 3 CONTAINERS, 23-1/2" FOR 4 CONTAINERS (2 REQD).

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

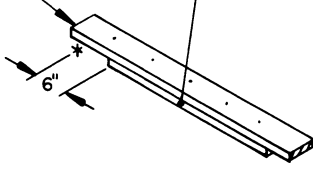
SEAL FOR 1-1/4" STRAP (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 15'-0" LONG STEEL STRAPPING (2 REQD). POSITION TO EXTEND OVER THE STRAPPING BOARD AND TO FORM A COMPLETE LOOP AROUND THE CONTAINERS. STAPLE TO THE STRAPPING BOARD W/2 STAPLES.



SECUREMENT OF THREE CONTAINERS

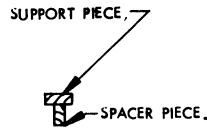
SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/5-12d NAILS.



TOP-OF-LOAD ANTI-SWAY BRACE A

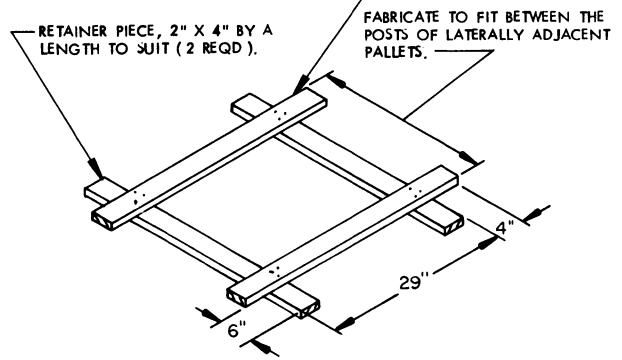
THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 4, 6, 10, AND 12.

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

BUFFER PIECE, 2" X 4" X 37" (2 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.



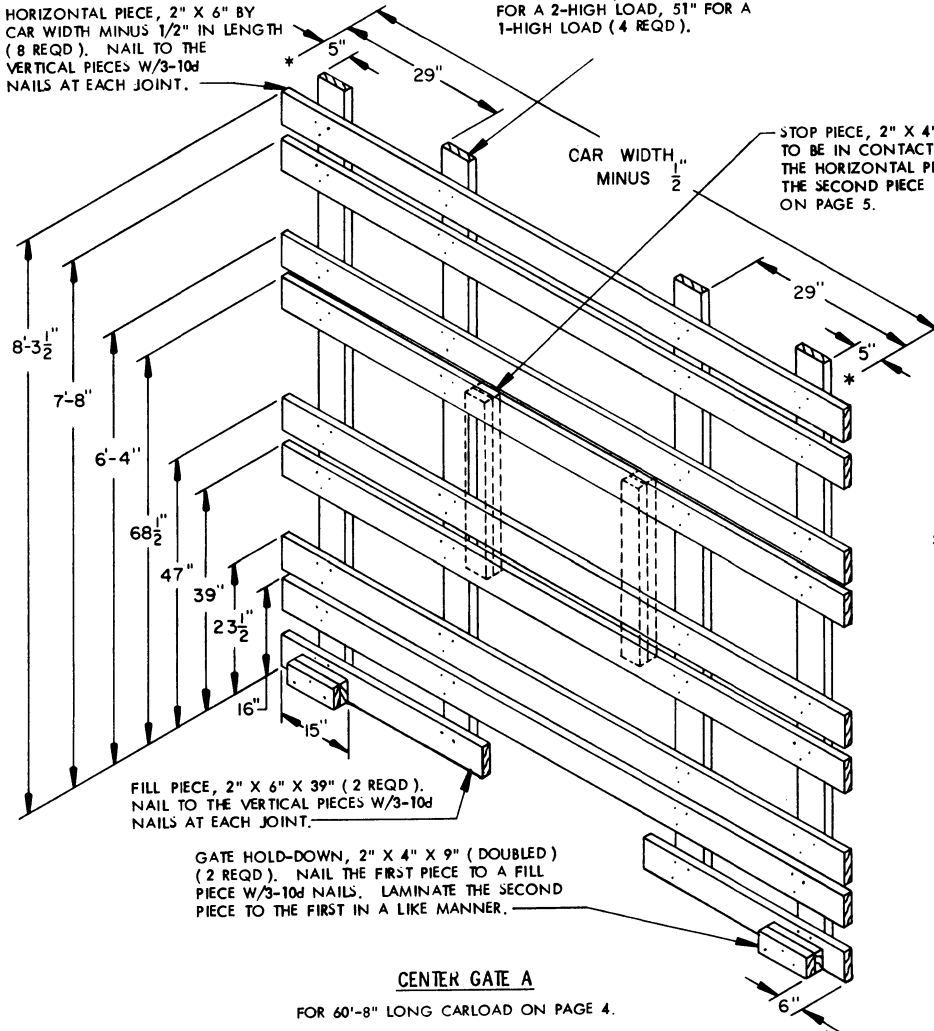
ANTI-SWAY BRACE A

FOR USE IN THE LENGTHWISE LOADS ON PAGES 4, 6, 10, AND 12.

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.

HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (8 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 8'-8" FOR A 2-HIGH LOAD, 51" FOR A 1-HIGH LOAD (4 REQD).

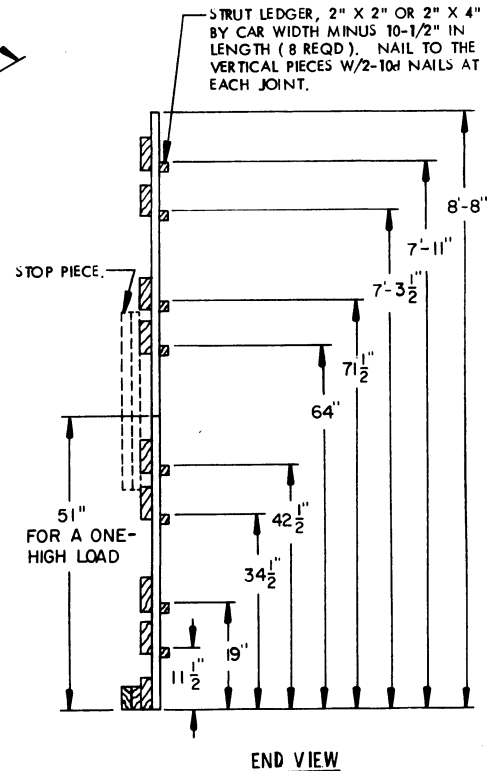


CENTER GATE A

FOR 60'-8" LONG CARLOAD ON PAGE 4.

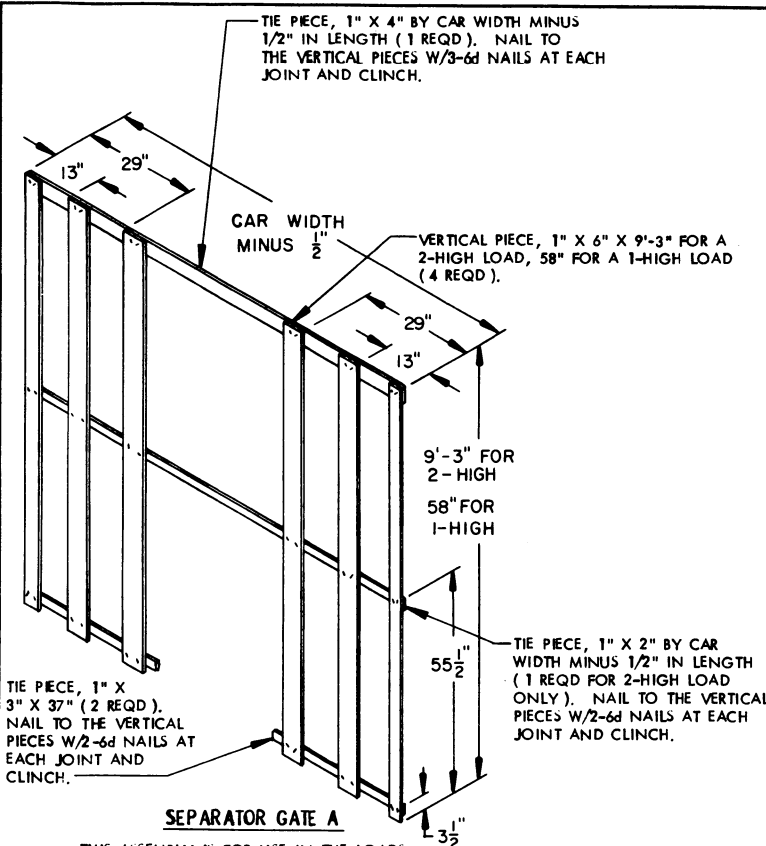
STOP PIECE, 2" X 4" X 30" (DOUBLED) (2 REQD). POSITION SO AS TO BE IN CONTACT WITH PALLET UNITS AND NAIL THE FIRST PIECE TO THE HORIZONTAL PIECES W/3-10d NAILS AT EACH JOINT. LAMINATE THE SECOND PIECE TO THE FIRST W/6-10d NAILS. SEE SPECIAL NOTE 7 ON PAGE 5.

STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 10-1/2" IN LENGTH (8 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



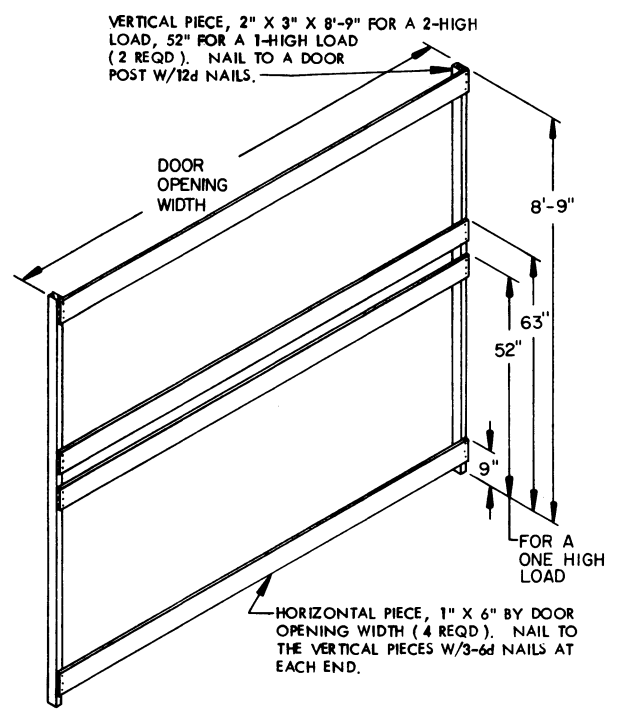
END VIEW

DETAILS

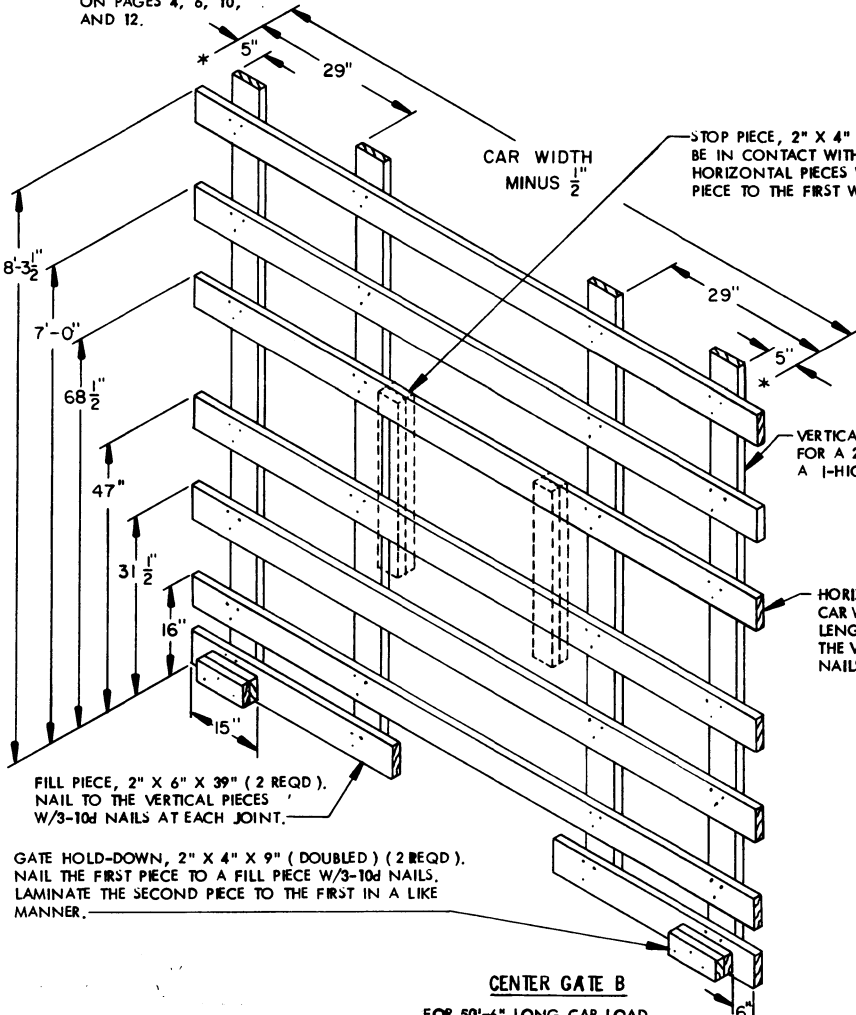


SEPARATOR GATE A

THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 4, 6, 10, AND 12.

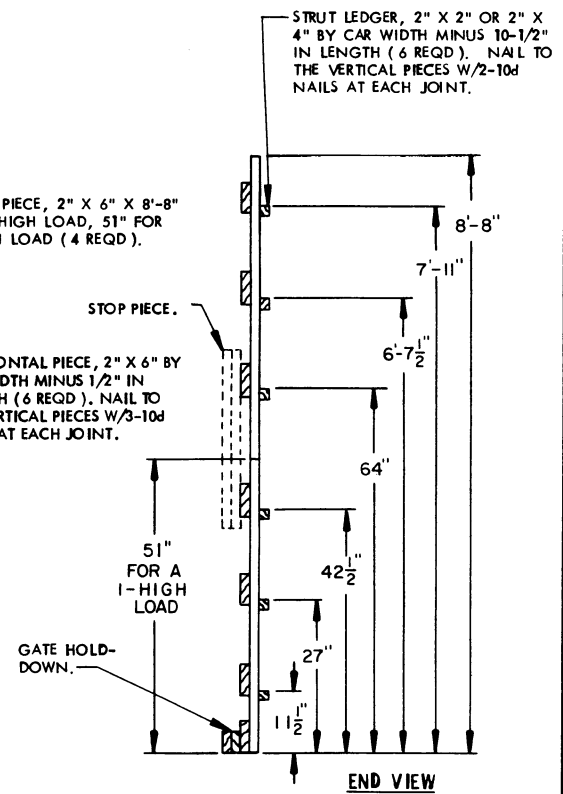


DOORWAY PROTECTION



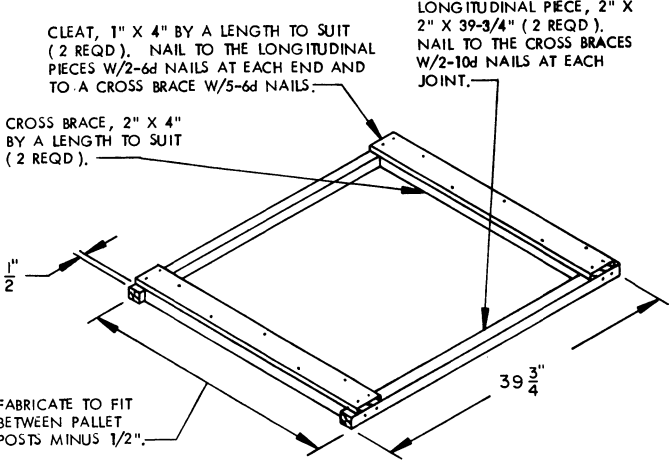
CENTER GATE B

FOR 50'-6" LONG CAR LOAD ON PAGE 6.



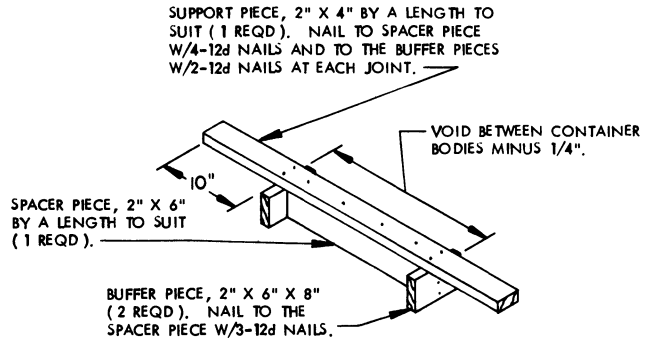
END VIEW

DETAILS



ANTI-SWAY BRACE B

FOR USE IN THE CROSSWISE LOADS ON PAGES 8 AND 14.



TOP-OF-LOAD ANTI-SWAY BRACE B

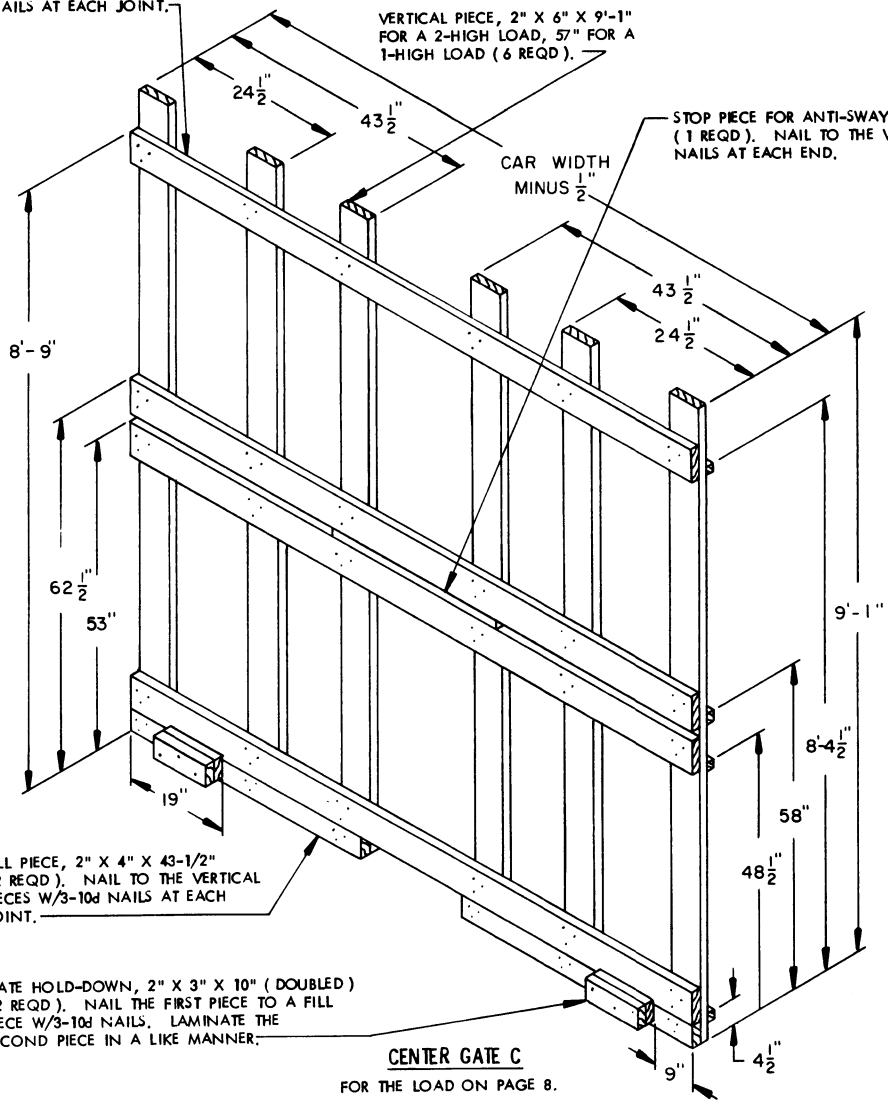
THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 8 AND 14.

HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" X 9'-1" FOR A 2-HIGH LOAD, 57" FOR A 1-HIGH LOAD (6 REQD).

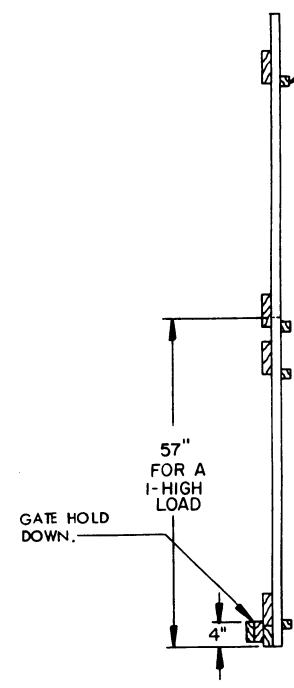
STOP PIECE FOR ANTI-SWAY BRACE, 2" X 4" X 36" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

CAR WIDTH MINUS 1/2"



CENTER GATE C
FOR THE LOAD ON PAGE 8.

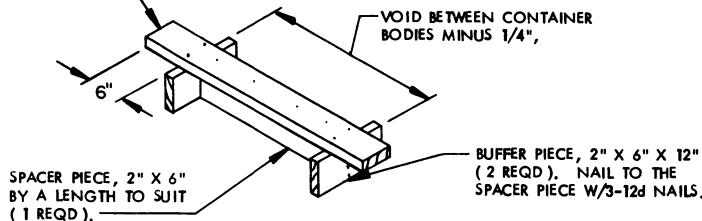
STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



END VIEW

DETAILS

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

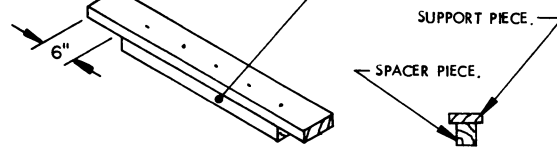


SPACER ASSEMBLY B

THIS ASSEMBLY IS FOR USE UNDER A DOORWAY PROTECTION STRAP WHICH IS INSTALLED AROUND PALLET UNITS OF CROSSWISE-POSITIONED CONTAINERS IN THE DOORWAY AREA OF A LOAD. SEE PIECE MARKED ④ ON PAGE 14 FOR A TYPICAL INSTALLATION.

SUPPORT PIECE, 2" X 6" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/3-12d 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.



END VIEW

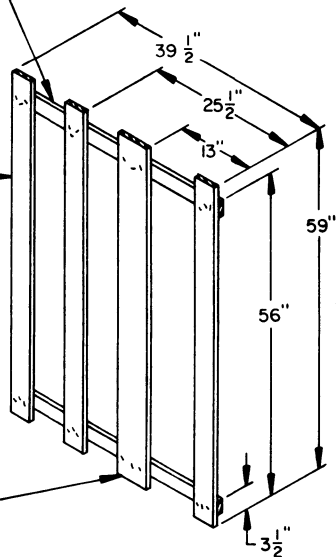
SPACER ASSEMBLY D

THIS ASSEMBLY IS FOR USE UNDER A DOORWAY PROTECTION STRAP WHICH IS INSTALLED AROUND PALLET UNITS OF LENGTHWISE POSITIONED CONTAINERS IN THE DOORWAY AREA OF A LOAD. SEE THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 55 FOR A TYPICAL INSTALLATION.

TI E PIECE, 1" X 3" X 39-1/2" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH.

VERTICAL PIECE, 1" X 4" X 59" (3 REQD).

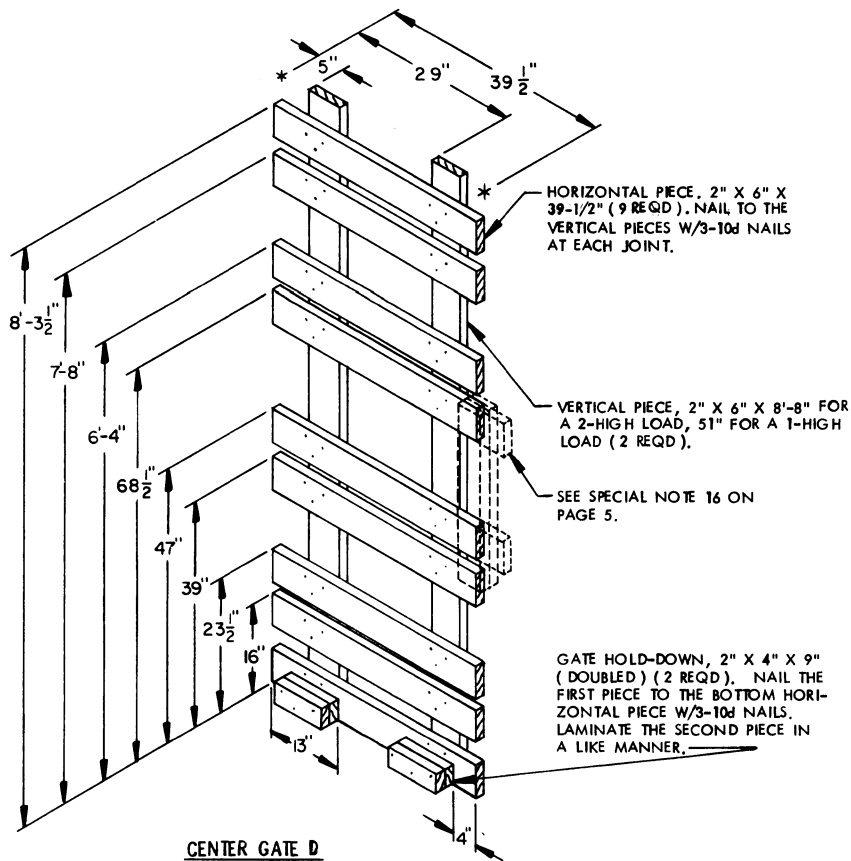
VERTICAL PIECE, 1" X 6" X 59" (1 REQD).



SEPARATOR GATE B

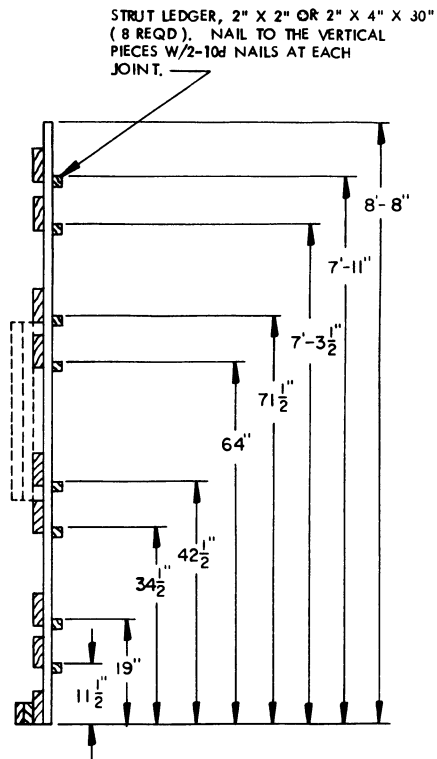
THIS ASSEMBLY IS FOR USE IN THE LOAD ON PAGE 34, AND FOR THE LCL LOAD IN A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES ON PAGE 12.

DETAILS

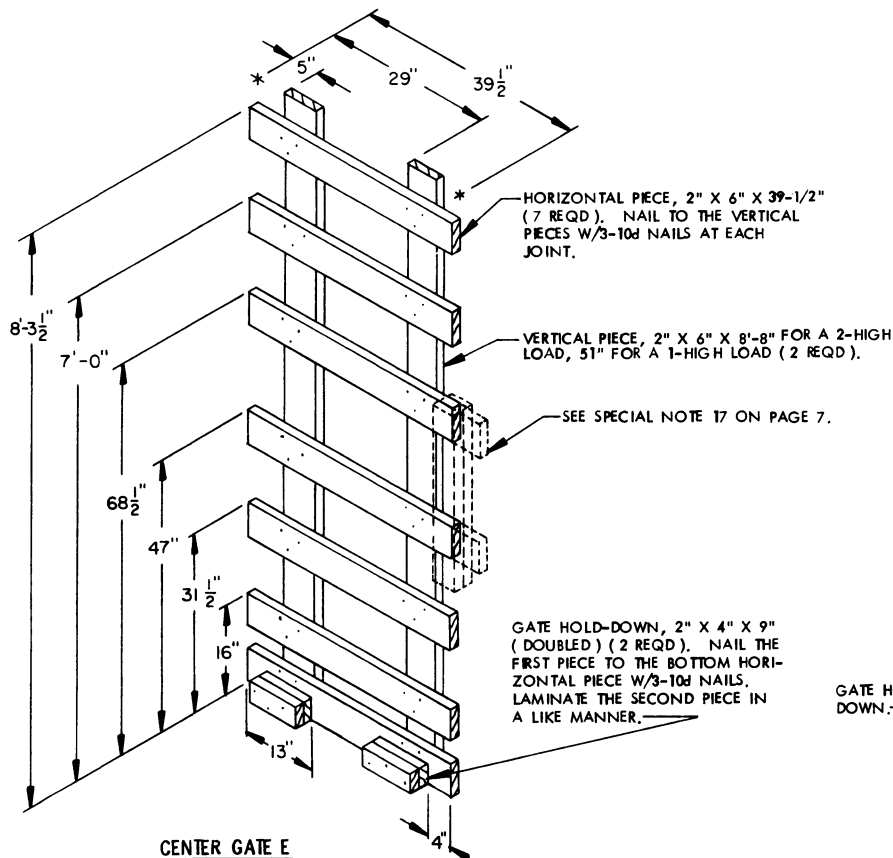


CENTER GATE D

SEE SPECIAL NOTE 9 ON PAGE 5.

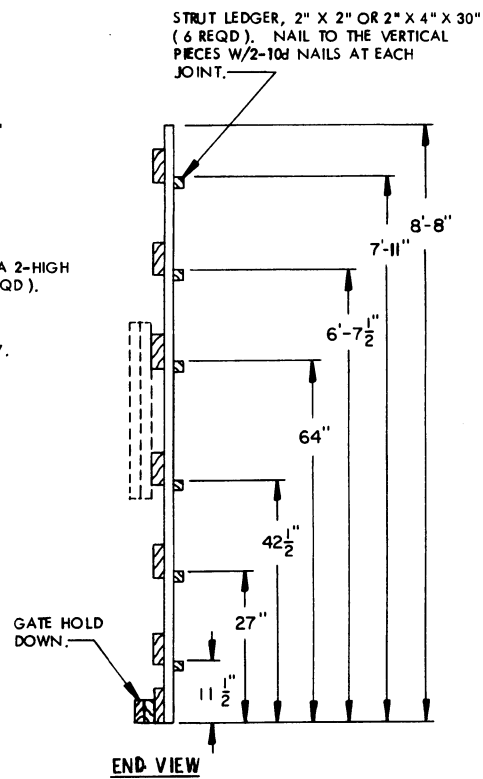


END VIEW



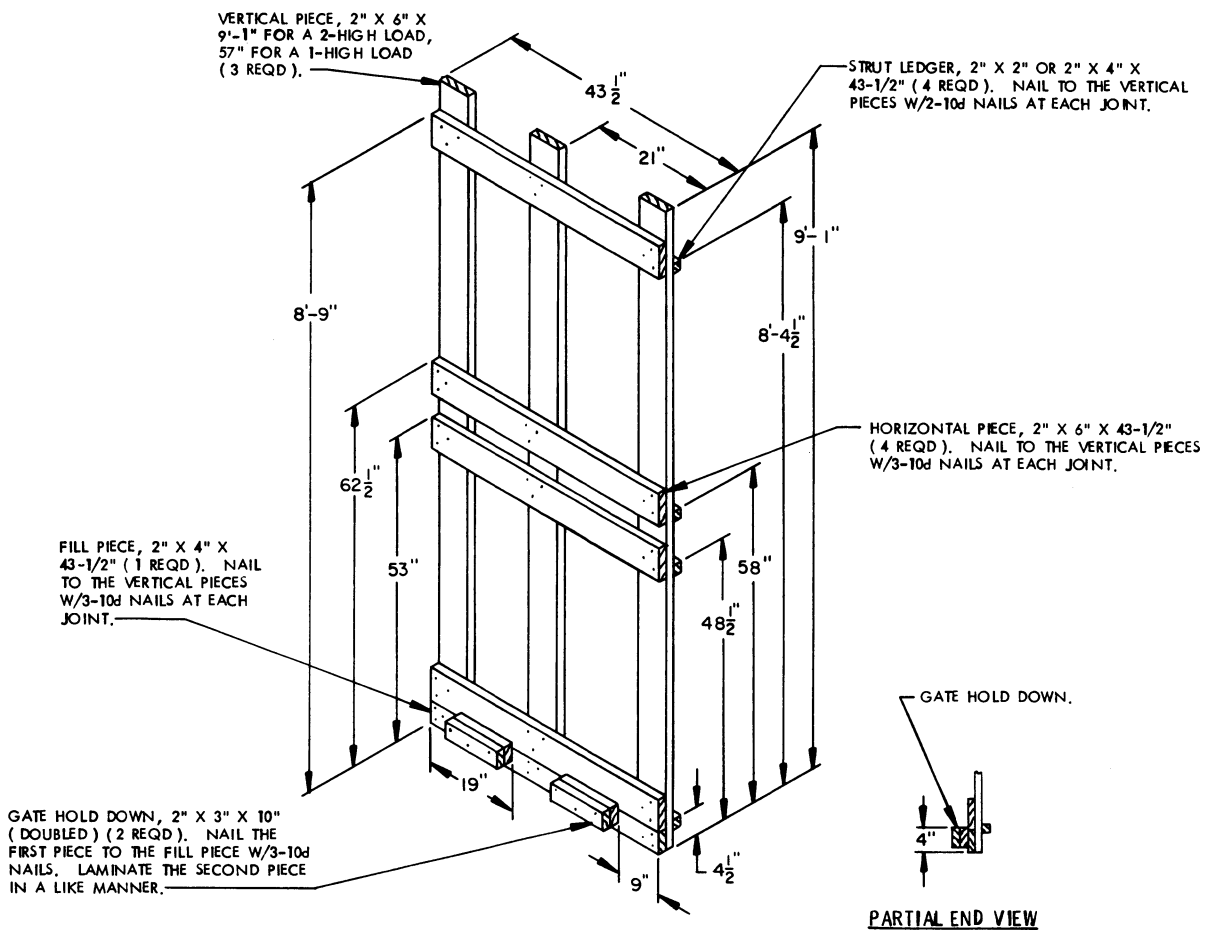
CENTER GATE E

SEE SPECIAL NOTE 9 ON PAGE 7.



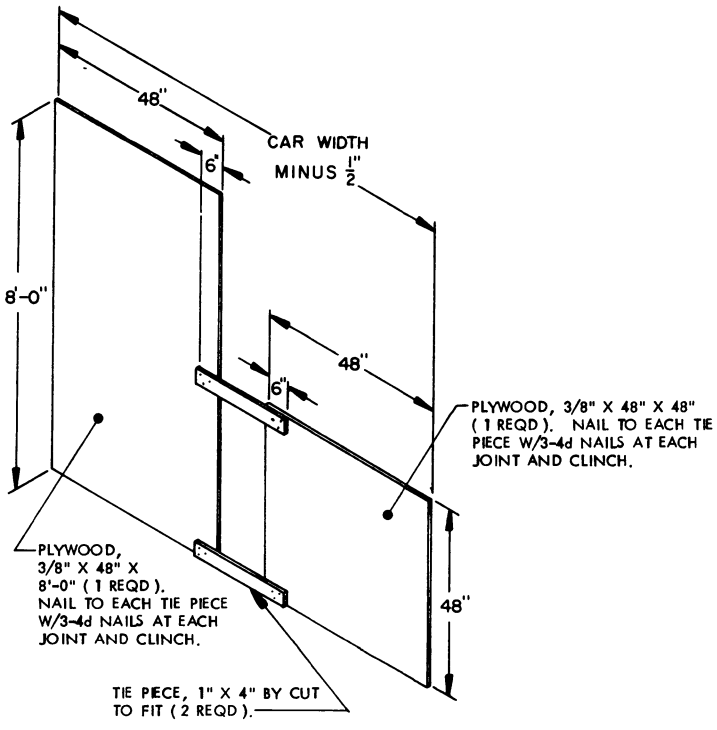
END VIEW

DETAILS



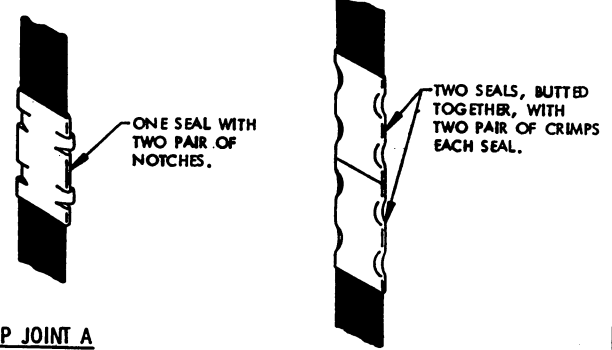
CENTER GATE F

SEE SPECIAL NOTE 6 ON PAGE 9.



SEPARATOR GATE D

THIS ASSEMBLY IS FOR USE IN THE OMITTED PALLET UNIT PROCEDURES SHOWN ON PAGE 19.



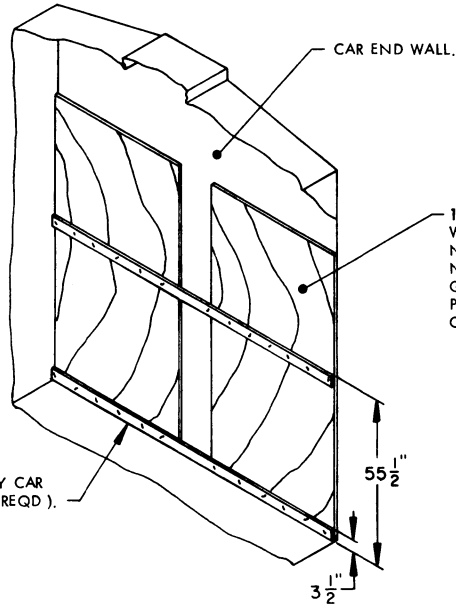
STRAP JOINT A

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



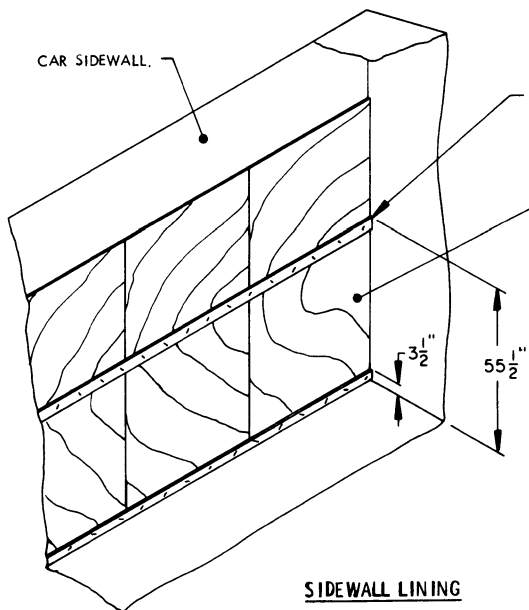
1/2" MINIMUM THICK PLYWOOD, UNIT LENGTH IN WIDTH (48" WIDE MAY BE USED) BY LOAD HEIGHT. NAIL TO THE TIE PIECES W/1 APPLICABLY SIZED NAIL EVERY 8" AND CLINCH. NOTE THAT SEPARATOR GATE "A" MAY BE USED IN LIEU OF PLYWOOD. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR END WALL.

TIE PIECE, 1" X 3" BY CAR WIDTH MINUS 1" (2 REQD).

55 1/2"
3 1/2"

END-WALL LINING

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



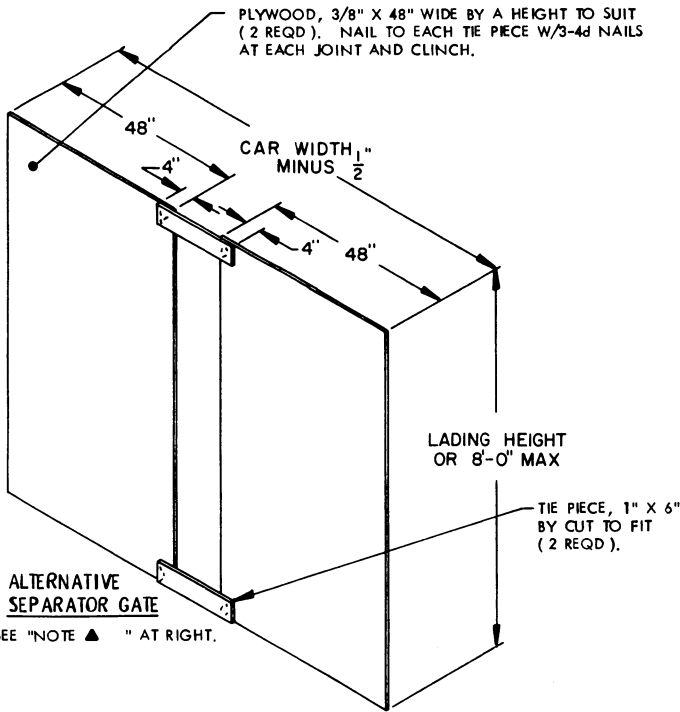
TIE PIECE, 1" X 3" BY RANDOM LENGTH. LOCATE AS SHOWN.

1/4" MINIMUM PLYWOOD, 1/8" MINIMUM HARDBOARD, OR .060" MINIMUM THICK SOLID WALL FIBERBOARD. NAIL PLYWOOD OR HARDBOARD TO 1" X 4" W/1 APPLICABLY SIZED NAIL EVERY 8". STAPLE FIBERBOARD TO 1" X 4" W/1 STAPLE EVERY 6". NOTE THAT SEPARATOR GATES, OR SIMILARLY POSITIONED VERTICAL 1" X 6" LUMBER, MAY BE USED PROVIDING THEY ARE TIED TOGETHER TO PREVENT DISLODGEEMENT.

55 1/2"
3 1/2"

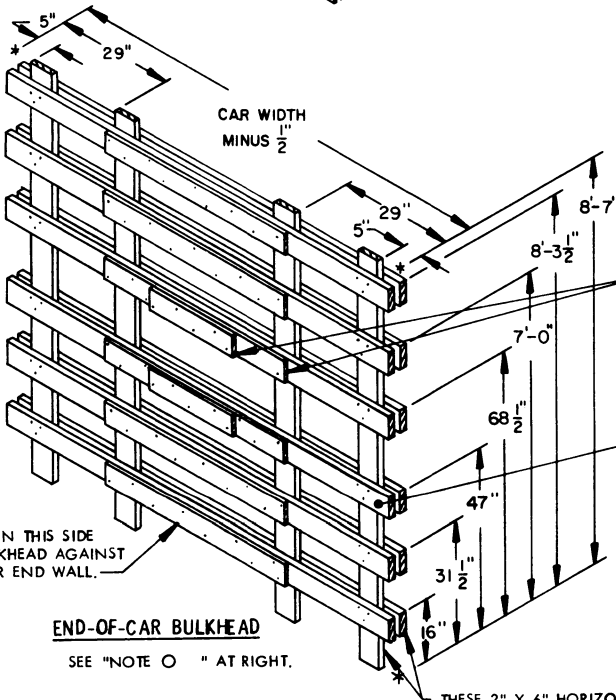
SIDEWALL LINING

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



NOTE ▲:

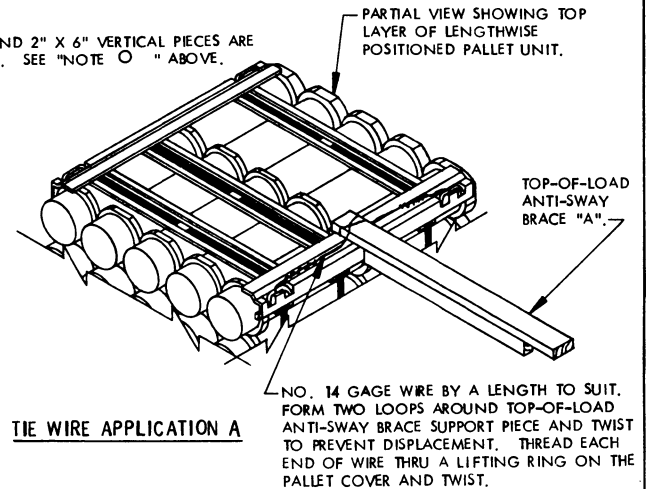
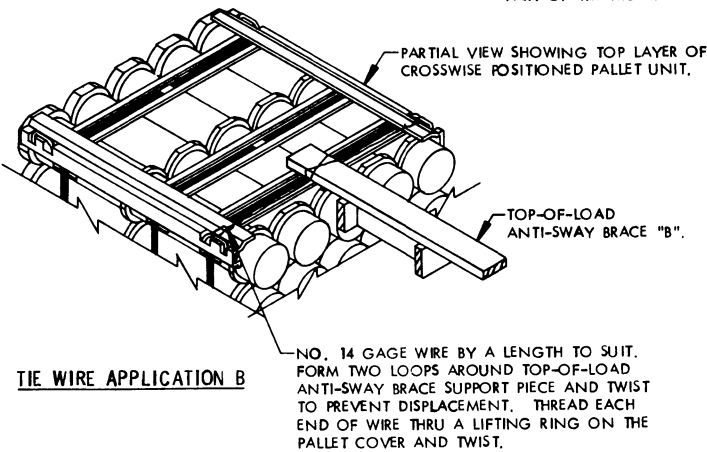
THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LIEU OF THE SEPARATOR GATE SHOWN WITHIN A LOAD, WHICH IS FABRICATED FROM 1" X 3" AND 1" X 6" MATERIAL. THE ALTERNATIVE SEPARATOR GATE MAY BE USED IN LOADS WHICH ARE EITHER ONE OR TWO PALLET UNITS IN HEIGHT.



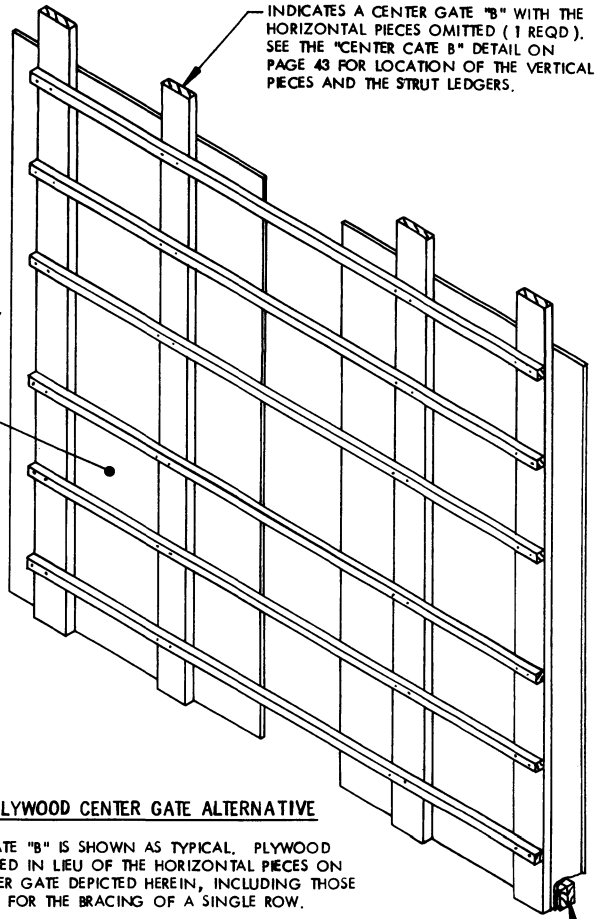
NOTE ○:

IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT POSITION (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "B", AS DETAILED ON PAGE 43, IS SHOWN AS TYPICAL.

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



PLYWOOD, 1/2" THICK BY THE UNIT WIDTH OR LENGTH BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6". NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT WIDTH IF THE LENGTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 8, OR UNIT LENGTH IF THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR AS TYPICALLY SHOWN IN THE LOAD ON PAGE 4. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH, WIDTH, OR HEIGHT IF DESIRED.



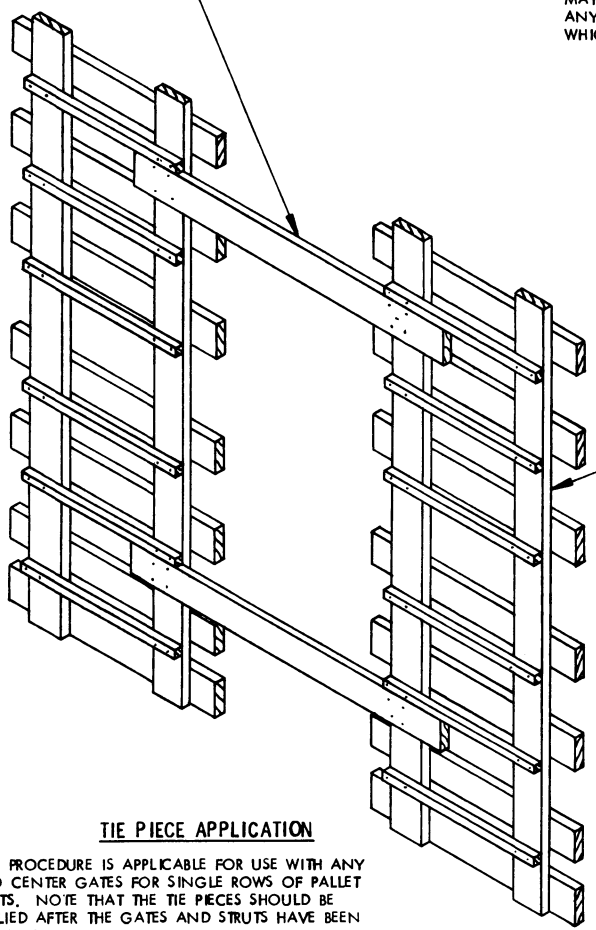
INDICATES A CENTER GATE "B" WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 43 FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.

GATE HOLD DOWN PIECES MUST BE SECURED TO THE PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE

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

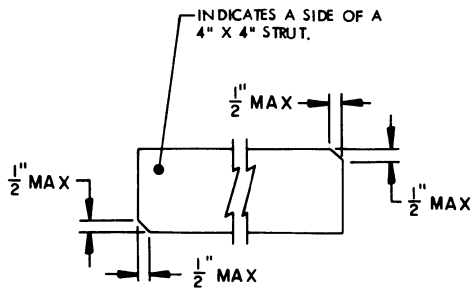
TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (2 REQD). POSITION UNDER AND IN CONTACT WITH THE UPPER-MOST STRUT LEDGERS AND/OR UNDER THE SECOND STRUT LEDGERS FROM THE BOTTOM. NAIL TO THE VERTICAL PIECES OF THE GATES W/4-10d NAILS AT EACH JOINT.



TIE PIECE APPLICATION

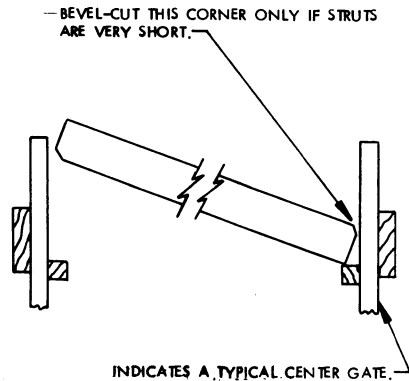
THIS PROCEDURE IS APPLICABLE FOR USE WITH ANY TWO CENTER GATES FOR SINGLE ROWS OF PALLET UNITS. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

INDICATES A TYPICAL "SPLIT" CENTER GATE (2 REQD). SEE THE CENTER GATE DETAIL WHICH IS APPLICABLE FOR THE ORIENTATION OF THE UNIT AND/OR THE LENGTH OF THE CAR BEING LOADED. A GATE FOR UNITS WHICH ARE POSITIONED WITH THE UNIT WIDTH PARALLEL TO THE CAR SIDEWALL IN A 50'-6" LONG CAR IS SHOWN. THE TIE PIECE APPLICATION PROCEDURE IS ALSO APPLICABLE TO GATES FOR LOADS IN A 60'-8" LONG CAR AND FOR UNITS WHICH ARE POSITIONED WITH THE UNIT LENGTH PARALLEL TO THE CAR SIDEWALL.



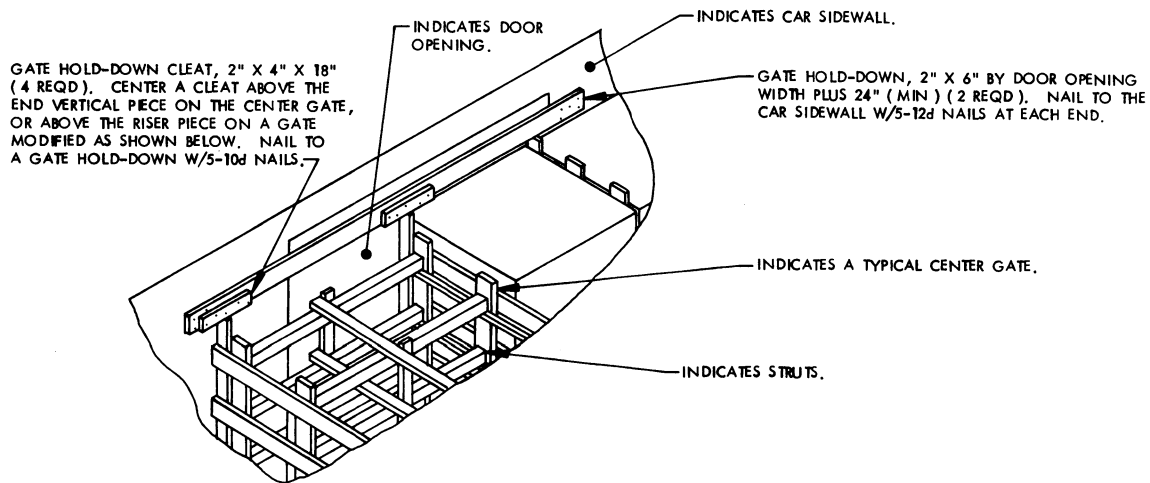
BEVEL-CUT

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").



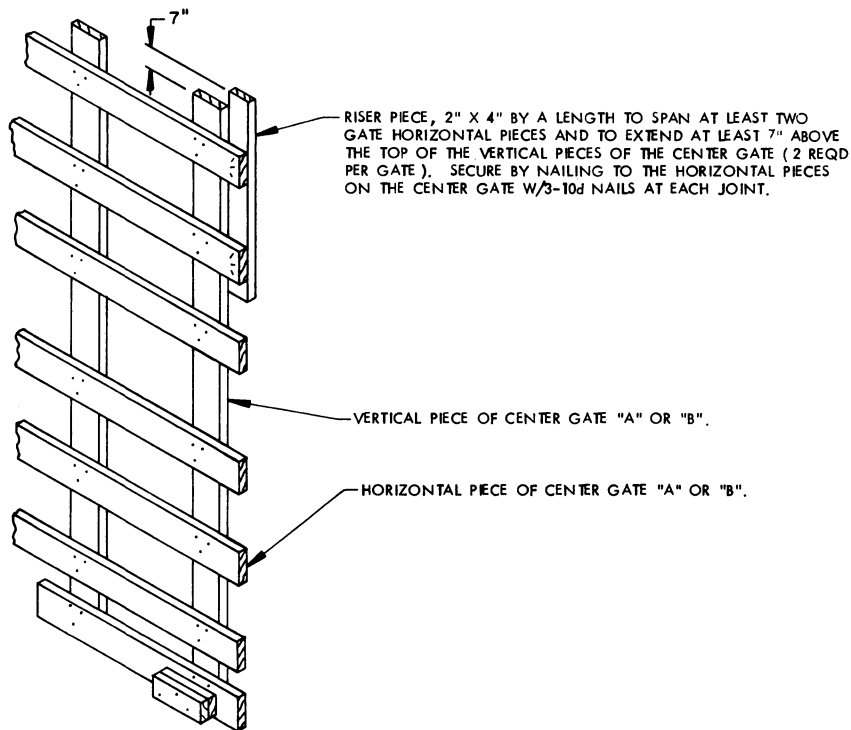
STRUT INSTALLATION

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



ALTERNATIVE GATE HOLD-DOWN

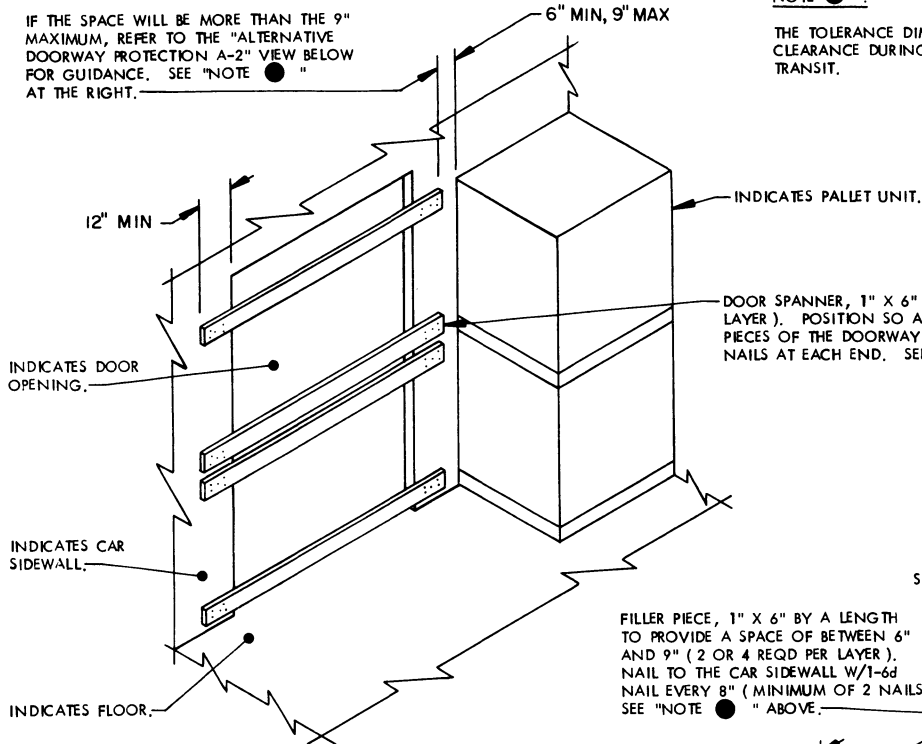
THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD-DOWN WHICH CAN BE USED, IF DESIRED, PROVIDING THE CAR HAS NAILABLE SIDEWALLS. THIS METHOD MAY BE APPLIED IN LIEU OF USING THE GATE HOLD-DOWN PIECES WHICH ARE PART OF A CENTER GATE. NOTE: IN THE EVENT THAT NEITHER CENTER GATE IS LOCATED IN OR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



CENTER GATE MODIFICATION

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

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



NOTE ● :

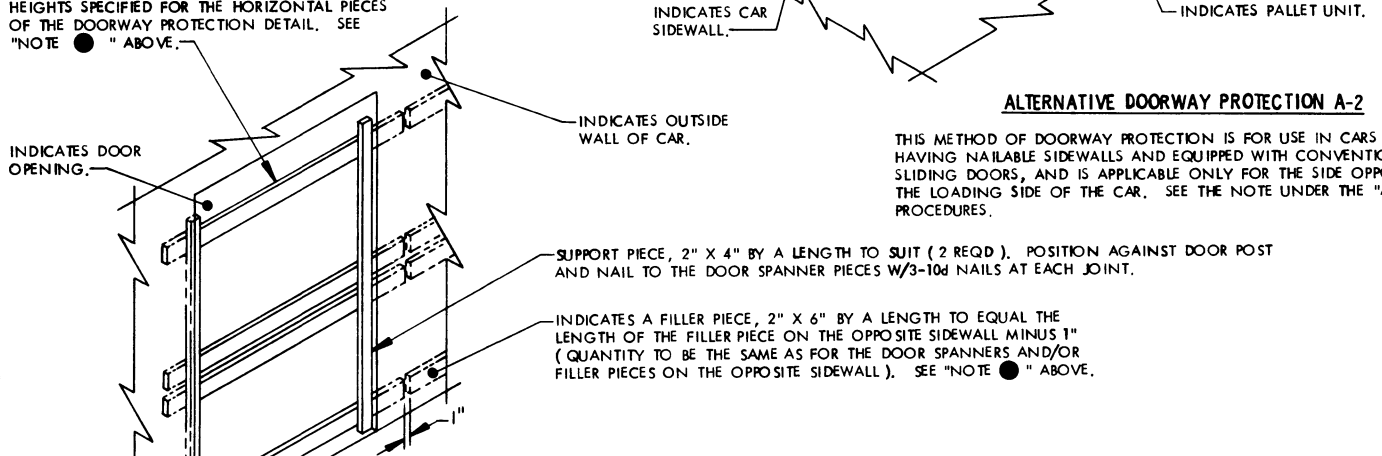
THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT.

ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR. THE "ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 54 OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED BY THE "ALTERNATIVE DOORWAY PROTECTION E" DETAIL ON PAGE 55 OR IN THE LOAD 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 THE "A-1" PROCEDURES.

ALTERNATIVE DOORWAY PROTECTION A-3

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

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 43 FOR HEIGHT LOCATIONS.

VIEW B

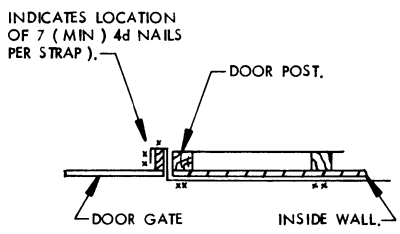
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

INDICATES FLOOR.

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



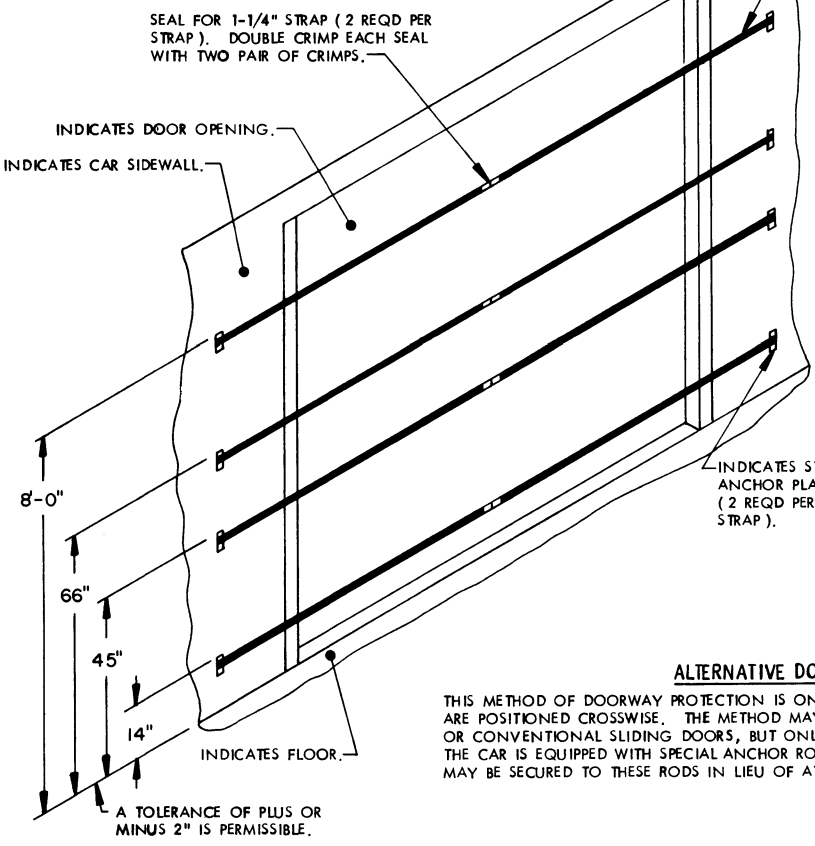
VIEW B

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

ALTERNATIVE DOORWAY PROTECTION B

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

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



DOOR SPANNER END OF STRAP.

VIEW A

INDICATES STRAP ANCHOR PLATE.

ISOMETRIC VIEW

VIEW A

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

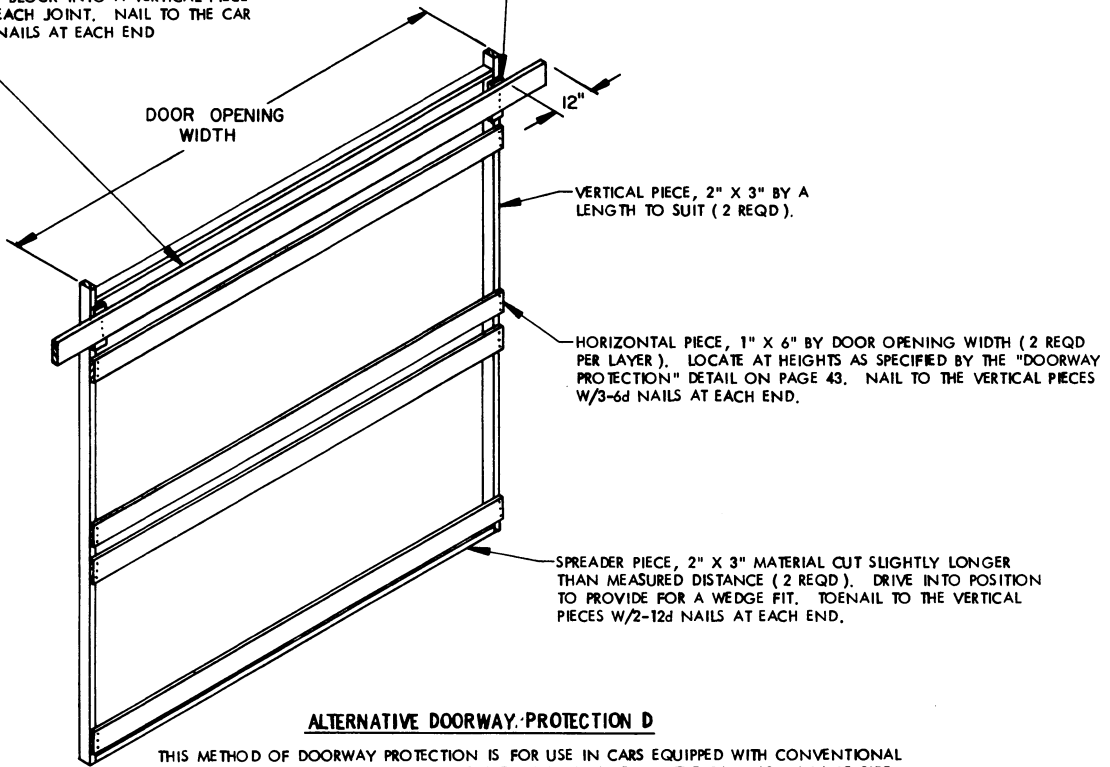
ALTERNATIVE DOORWAY PROTECTION C

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

DOORWAY PROTECTION

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

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



DOOR OPENING WIDTH

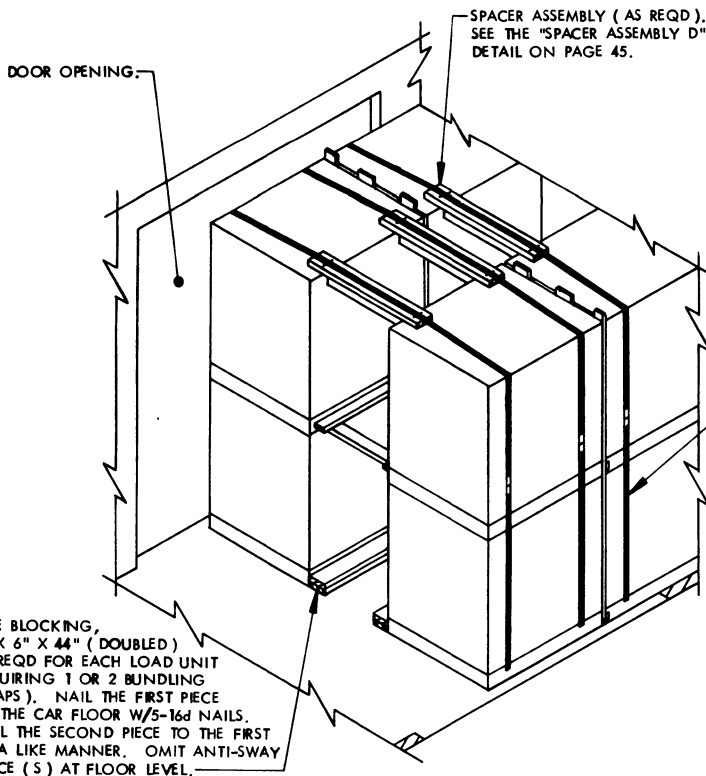
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (2 REQD PER LAYER). LOCATE AT HEIGHTS AS SPECIFIED BY THE "DOORWAY PROTECTION" DETAIL ON PAGE 43. NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

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

ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT AVAILABLE. IF THE CAR HAS AVAILABLE 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 54 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 52.



SPACER ASSEMBLY (AS REQD). SEE THE "SPACER ASSEMBLY D" DETAIL ON PAGE 45.

DOOR OPENING

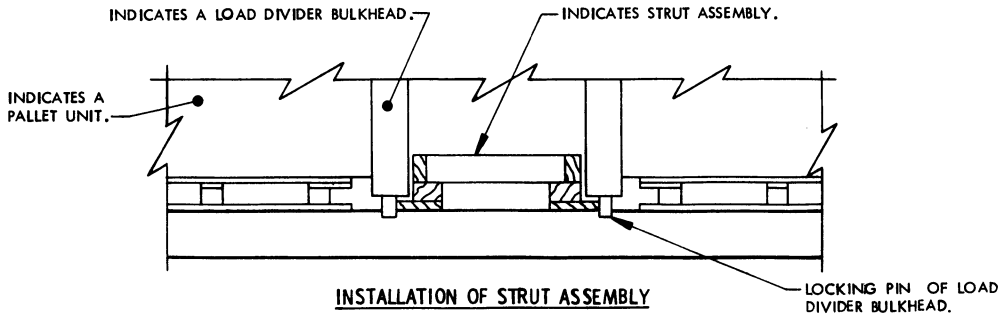
BUNDLING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (AS REQD). STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE "NOTE * " BELOW.

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

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

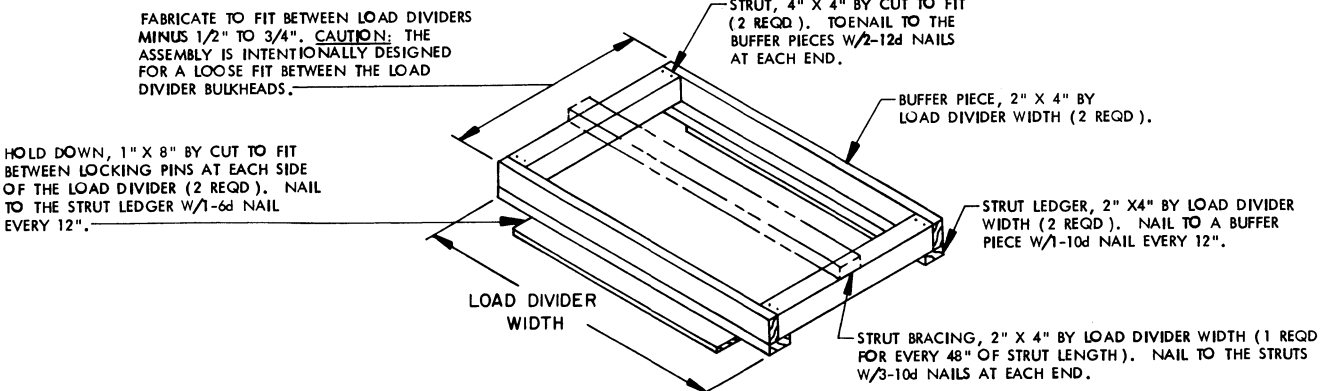
ALTERNATIVE DOORWAY PROTECTION E

DOORWAY PROTECTION



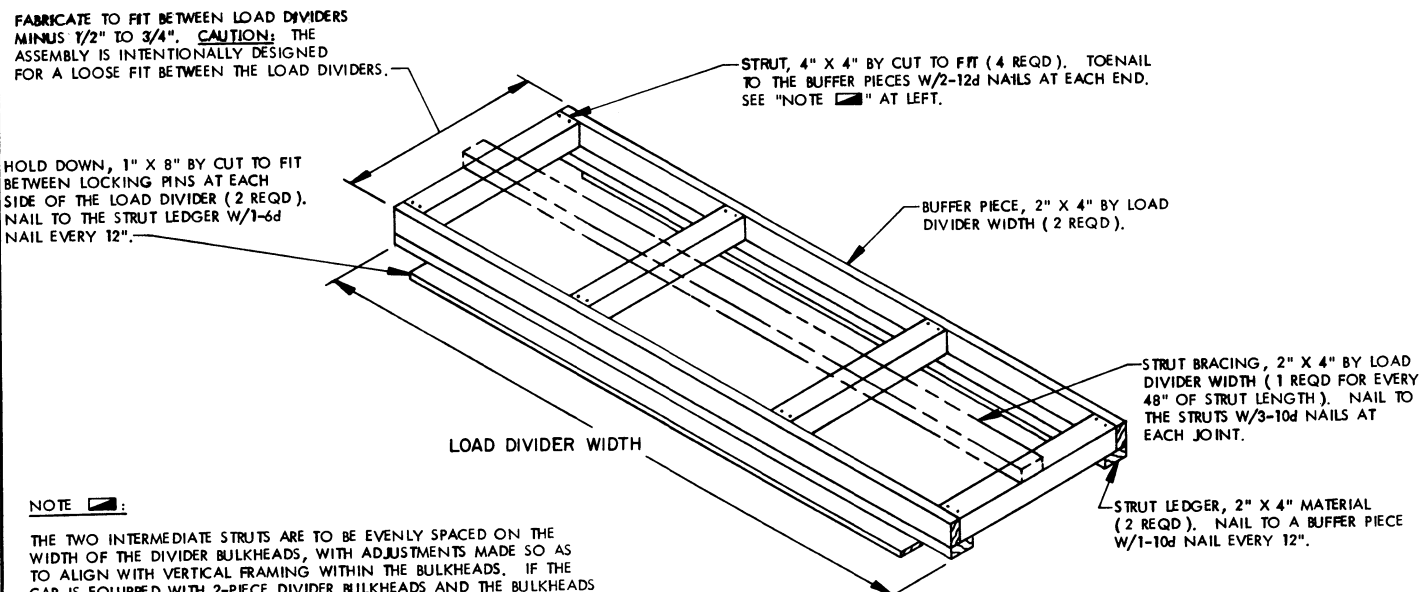
INSTALLATION OF STRUT ASSEMBLY

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.



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

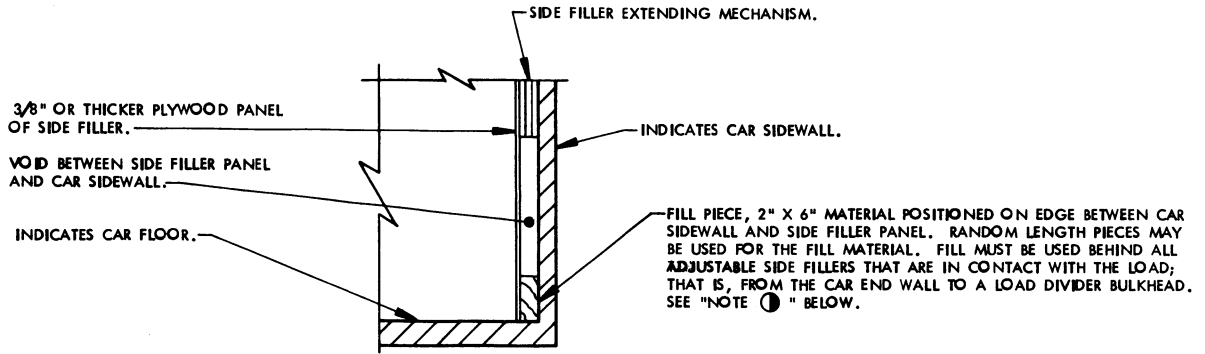
A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. NOTE: TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD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



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.

PROVISIONS FOR BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS

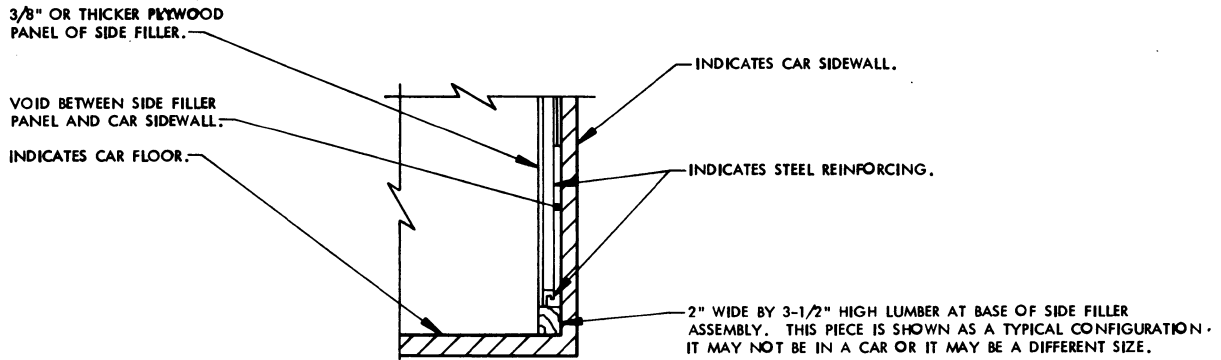


TYPICAL TYPE A

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

NOTE 1:

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



TYPICAL TYPE B

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

