


J. H. Ashman
DATE 10/27/92

LOADING AND BRACING (CL & LCL) IN BOX CARS OF PALLETIZED PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINER PA107 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.

DO NOT SCALE

REVISIONS				DRAWN	TYPED	CHECKER	TECHNICIAN	ENGINEER
				<i>BRK</i>	<i>PT</i>			
				SMCAG-DEV	SMCAG-DET	SMCAG-DE		
				<i>W. J. Ernst</i>	<i>W. J. Ernst</i>			
				APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIEL COMMAND (AMC)				
				<i>William J. Ernst</i>				
				U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL				
				U.S. ARMY MATERIEL COMMAND				
				DECEMBER 1992				
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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 PA107 SERIES PROPELLING CHARGE CONTAINER WHEN UNITIZED ON 35" X 45-1/2" FOUR WAY ENTRY PALLET. SEE THE PICTORIAL VIEW ON PAGE 4. REFER TO THE U.S. ARMY DARCOM (AMC) DRAWING ~~TR-80-4042A/24-20PM1001~~ FOR UNITIZATION PROCEDURES FOR THE PA107 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 PROPELLING CHARGE CONTAINERS THAT OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND/OR END WALLS. IF CARS WITH WOOD SIDEWALLS AND/OR END WALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE SIDEWALLS AND/OR END WALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE. REFER TO PAGE 50 FOR GUIDANCE.
- E. PALLET UNITS WILL BE POSITIONED WITH THE BASE END 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. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT, IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING, FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHARTS ON PAGE 28 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- G. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF PALLETIZED UNITS OF PROPELLING CHARGES IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.
- H. 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 51 FOR GUIDANCE.
- J. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. **CAUTION:** DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- K. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- L. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF PROPELLING CHARGES, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN. MIXED ITEMS TO BE SHIPPED IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MUST BE SEPARATELY BLOCKED, USING THE PROCEDURES SHOWN FOR THESE CARS AS GUIDANCE.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

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

(GENERAL NOTES CONTINUED)

- M. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- N. **NOTE:** 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.
- O. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. **NOTE:** STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD-RESTRAINING FLOOR DUNNAGE APPLICATION.
- P. 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 5 FOR GUIDANCE.
- Q. 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.
- R. 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. **NOTE:** A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- S. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- T. 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 "N" ABOVE.
- U. **NOTE:** 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.
- V. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY PIECES MARKED (3) AND (4) ON PAGES 8 AND 10. 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)

W. 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 57 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.

X. 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)

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

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

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

Z. 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.

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

GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

BB. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDER MANUFACTURED BY EVANS, EQUIFCO, 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.

CC. 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 PROPELLING CHARGES. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.

DD. 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 59 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 59, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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

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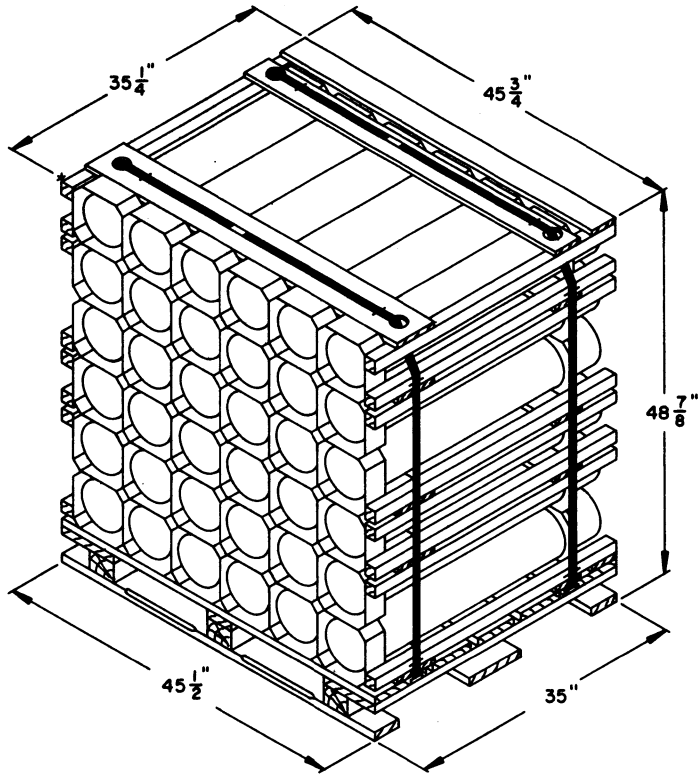
(GENERAL NOTES CONTINUED)

FF. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "GG-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 58.

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

1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGE 32 THRU 35.
2. THE "GATES AND STRUTS" METHOD OF OMITTING A PALLET UNIT MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGES 30 AND 31 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 AN EVEN LAYER WHICH IS ONE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH ICL BRACES AS SHOWN ON PAGE 25, OR WITH KNEE BRACES ASSEMBLIES, AS SHOWN ON PAGE 42.

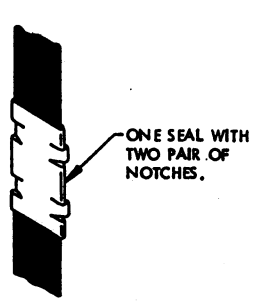
HH. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



PALLET UNIT

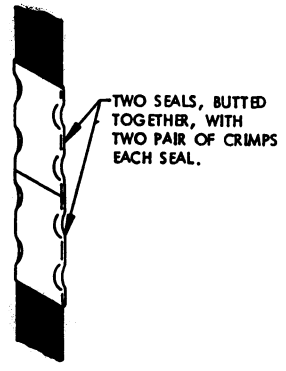
CONTAINER-----36 EACH @ 39 LBS (APPROX)
 CUBE-----45.6 CUBIC FEET (APPROX)
 GROSS WEIGHT-----1,540 LBS (APPROX)

PALLET UNIT DETAIL



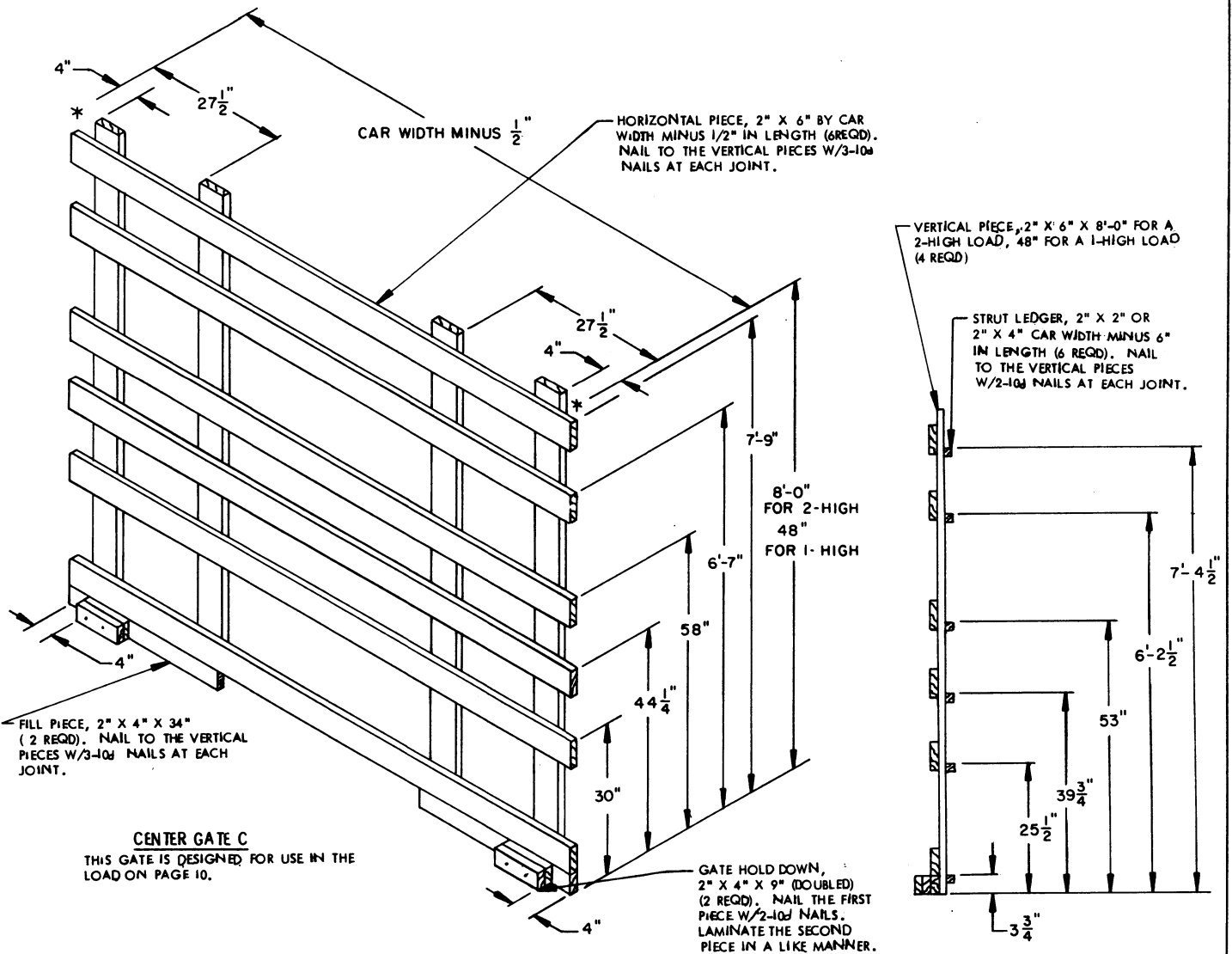
STRAP JOINT A

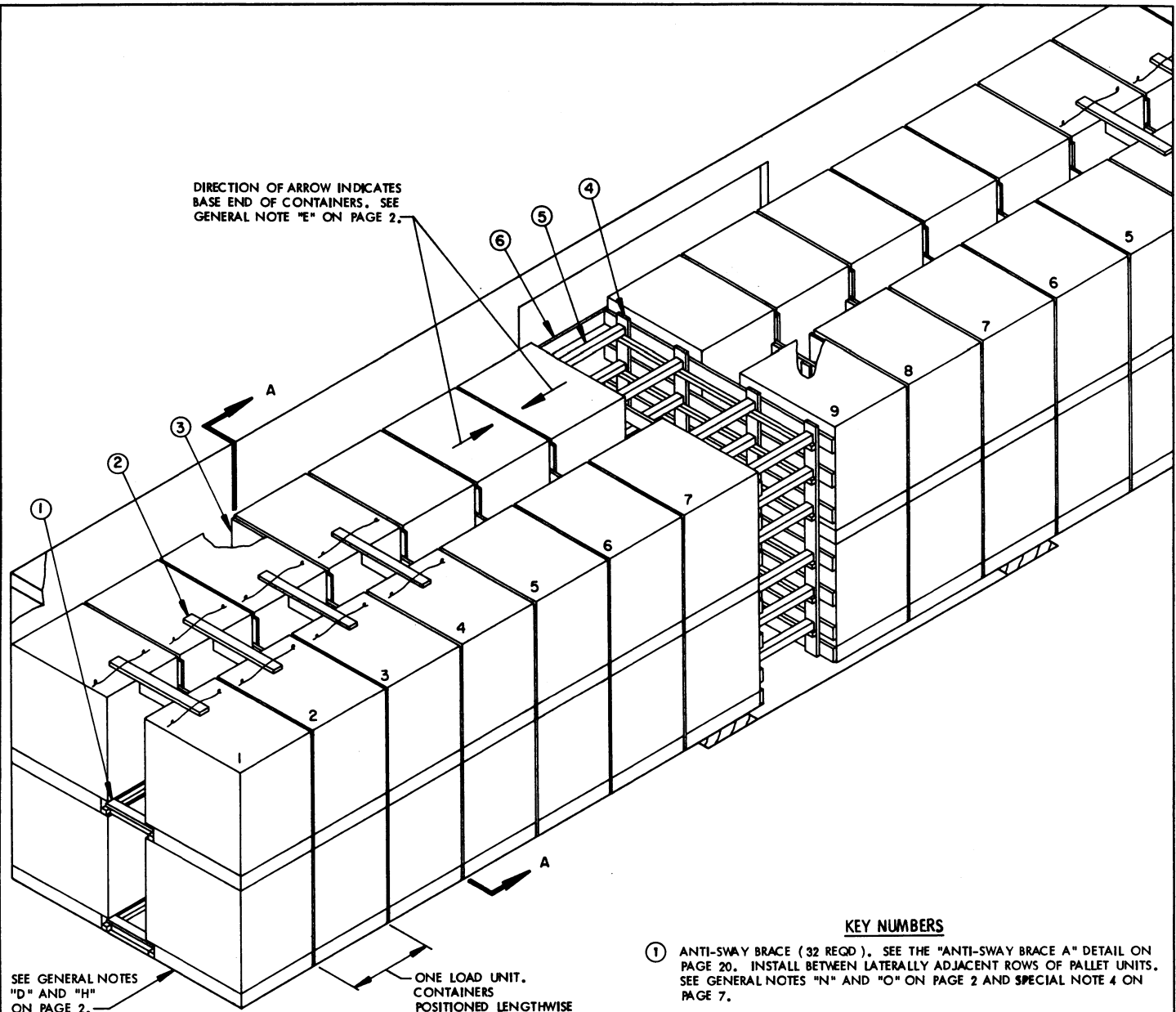
METHOD OF SECURING A STRAP JOINT WHEN USING A NOTCH-TYPE SEALER.



STRAP JOINT B

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

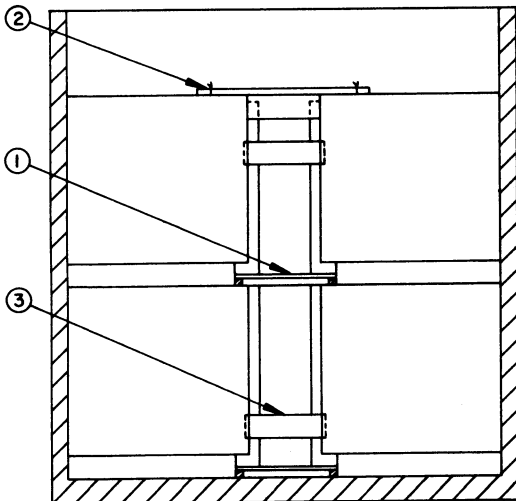




ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51. SEE SPECIAL NOTE 5 ON PAGE 7.
- ③ SEPARATOR GATE (14 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20. SEE SPECIAL NOTES 6, 7, AND 8 ON PAGE 7.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 21. SEE SPECIAL NOTES 9, 10, AND 11 ON PAGE 7.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 30-3/4") (24 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 21. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 12 ON PAGE 7.



SECTION A-A

(SPECIAL NOTES CONTINUED)

10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES H" AS SHOWN ON PAGE 53. 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 52.
11. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 54 FOR GUIDANCE.
12. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (6) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 55 THRU 57 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED, AS SHOWN IN THE LOAD ON PAGE 18. SEE THE STRAPPING BOARD ASSEMBLY "A" DETAIL ON PAGE 21. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
13. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) 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 25 THRU 49 FOR GUIDANCE.
14. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 46 FOR SHIPPING GUIDANCE.
15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

SPECIAL NOTES:

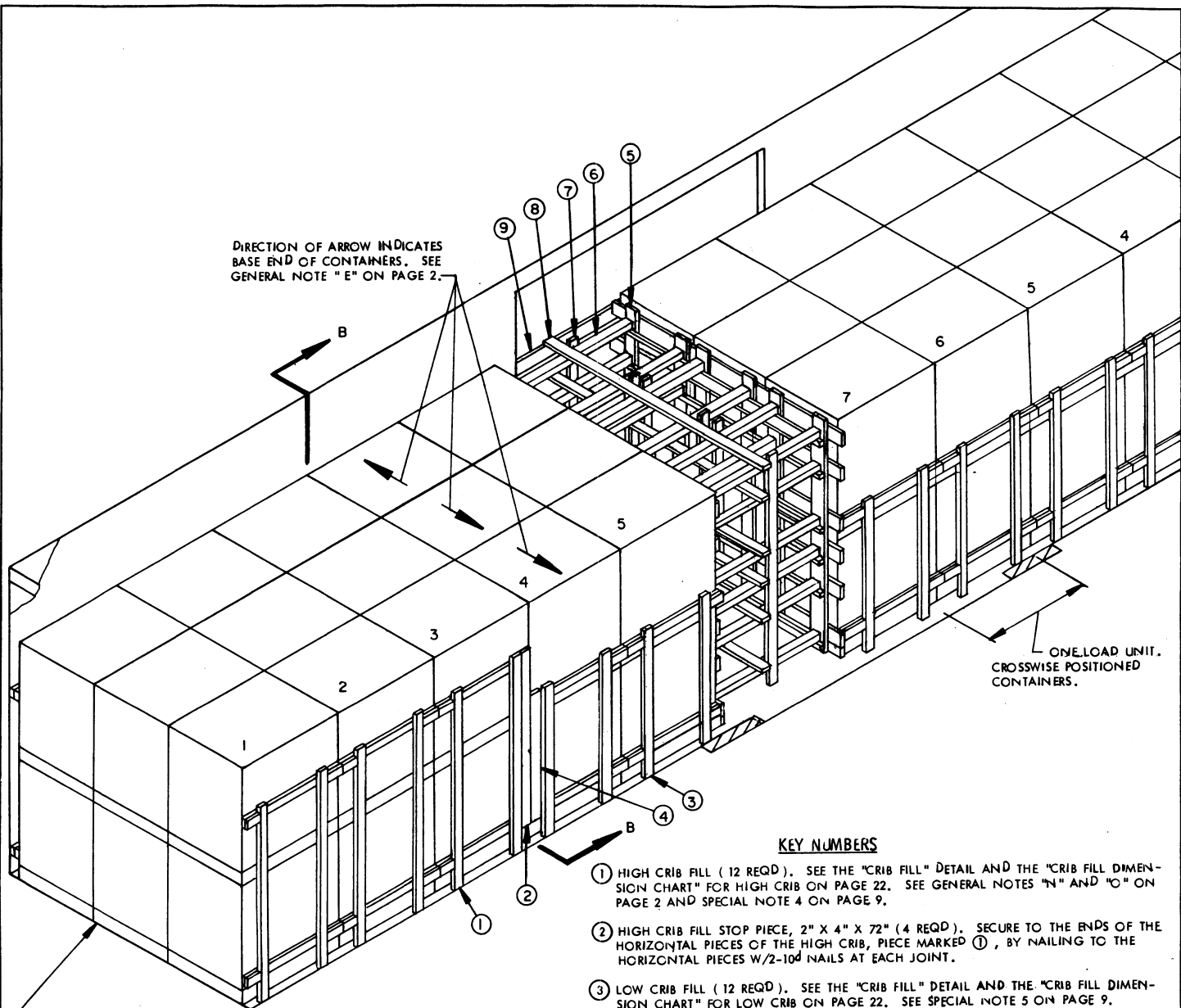
1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. A MAXIMUM OF SEVENTY-SIX (76) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 117,040 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-EIGHT (48) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 73,920 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.
3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' THRU 10' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD WHEN NECESSARY, THE PALLETS SHOULD BE POSITIONED SO THERE ARE EIGHT (8) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
4. IF THE "ALTERNATIVE DOORWAY PROTECTION" PROCEDURES AS SHOWN ON PAGE 18 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (6), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR. SEE SPECIAL NOTE 12.
5. 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 CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40' AND 50' LONG CARS. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.
6. 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 6" TIE PIECES ARE LOCATED TOWARD THE ALREADY LOADED PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
7. WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE SEPARATOR GATES ADJACENT TO THE NAILED BLOCKING MUST BE MODIFIED TO ALLOW FOR THE NORMAL SHIFTING OF THE LOAD. SEE THE SEPARATOR GATE "A" DETAIL ON PAGE 20. ALSO, UNLESS THE CAR IS EQUIPPED WITH PLUG DOORS, THE SEPARATOR GATES IN THE DOORWAY MUST BE PREVENTED FROM SHIFTING INTO A DOOR OPENING BY THE APPLICATION OF STOP PIECES AS SHOWN ON THE DETAIL.
8. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24 FOR CONSTRUCTION GUIDANCE.
9. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 52 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	138	46
1" X 6"	129	65
2" X 2"	289	97
2" X 3"	38	19
2" X 4"	157	105
2" X 6"	201	201
4" X 4"	62	83
NAILS	NO. REQD	POUNDS
6d (2")	664	4
10d (3")	544	8-1/2
12d (3-1/4")	56	1
16d (3-1/2")	96	2-1/4
PLYWOOD, 3/8" X 4' X 8' -----28 REQD----- 924 LBS		
WIRE, NO. 14 GAGE -----96' REQD----- 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	64-----	98,560 LBS
DUNNAGE-----	-----	2,174 LBS
TOTAL WEIGHT-----		100,734 LBS (APPROX)



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

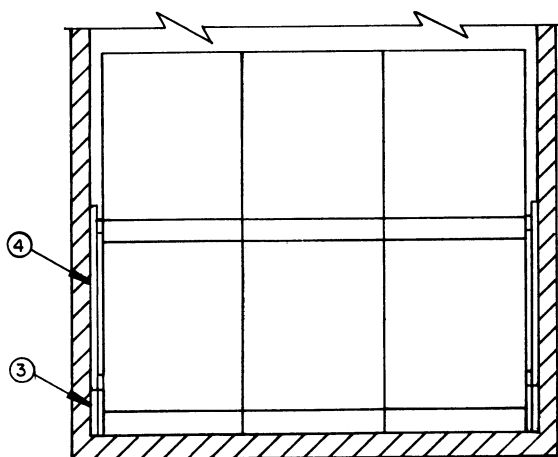
ONE LOAD UNIT.
CROSSWISE POSITIONED
CONTAINERS.

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

ISOMETRIC VIEW

KEY NUMBERS

- ① HIGH CRIB FILL (12 REQD). SEE THE "CRIB FILL" DETAIL AND THE "CRIB FILL DIMENSION CHART" FOR HIGH CRIB ON PAGE 22. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.
- ② HIGH CRIB FILL STOP PIECE, 2" X 4" X 72" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES OF THE HIGH CRIB, PIECE MARKED ①, BY NAILING TO THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT.
- ③ LOW CRIB FILL (12 REQD). SEE THE "CRIB FILL" DETAIL AND THE "CRIB FILL DIMENSION CHART" FOR LOW CRIB ON PAGE 22. SEE SPECIAL NOTE 5 ON PAGE 9.
- ④ LOW CRIB FILL STOP PIECE, 2" X 4" X 54" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES OF THE LOW CRIB, PIECE MARKED ③, BY NAILING TO THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 22. SEE SPECIAL NOTES 7 AND 8 ON PAGE 9.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 51") (36 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- ⑦ VERTICAL STRUT BRACING, 2" X 4" X 8'-0" (6 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑥, W/3-10d NAILS AT EACH JOINT.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 8'-9" (6 REQD). NAIL TO THE STRUTS, PIECE MARKED ⑥, W/3-10d NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 23. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 9.



SECTION B-B

(SPECIAL NOTES CONTINUED)

9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" HOLD DOWNS ON CENTER GATES "B", PROVIDING THE CAR BEING LOADED IS 9'-2" OR LESS IN WIDTH AND ALSO PROVIDING THE CAR HAS AVAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 54 FOR GUIDANCE.
10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (9) IN THE LOAD ON PAGE 8 IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 55 THRU 57 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED, AS SHOWN IN THE LOAD ON PAGE 18. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.
11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF THREE (3) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. THE ENTIRE TOP TIER CAN BE OMITTED, OR THE TOP TIER OF JUST THE MIDDLE ROW CAN BE OMITTED AS SHOWN IN THE LOAD ON PAGE 12. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 25 THRU 49 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 47 AND 49 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURE FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

SPECIAL NOTES:

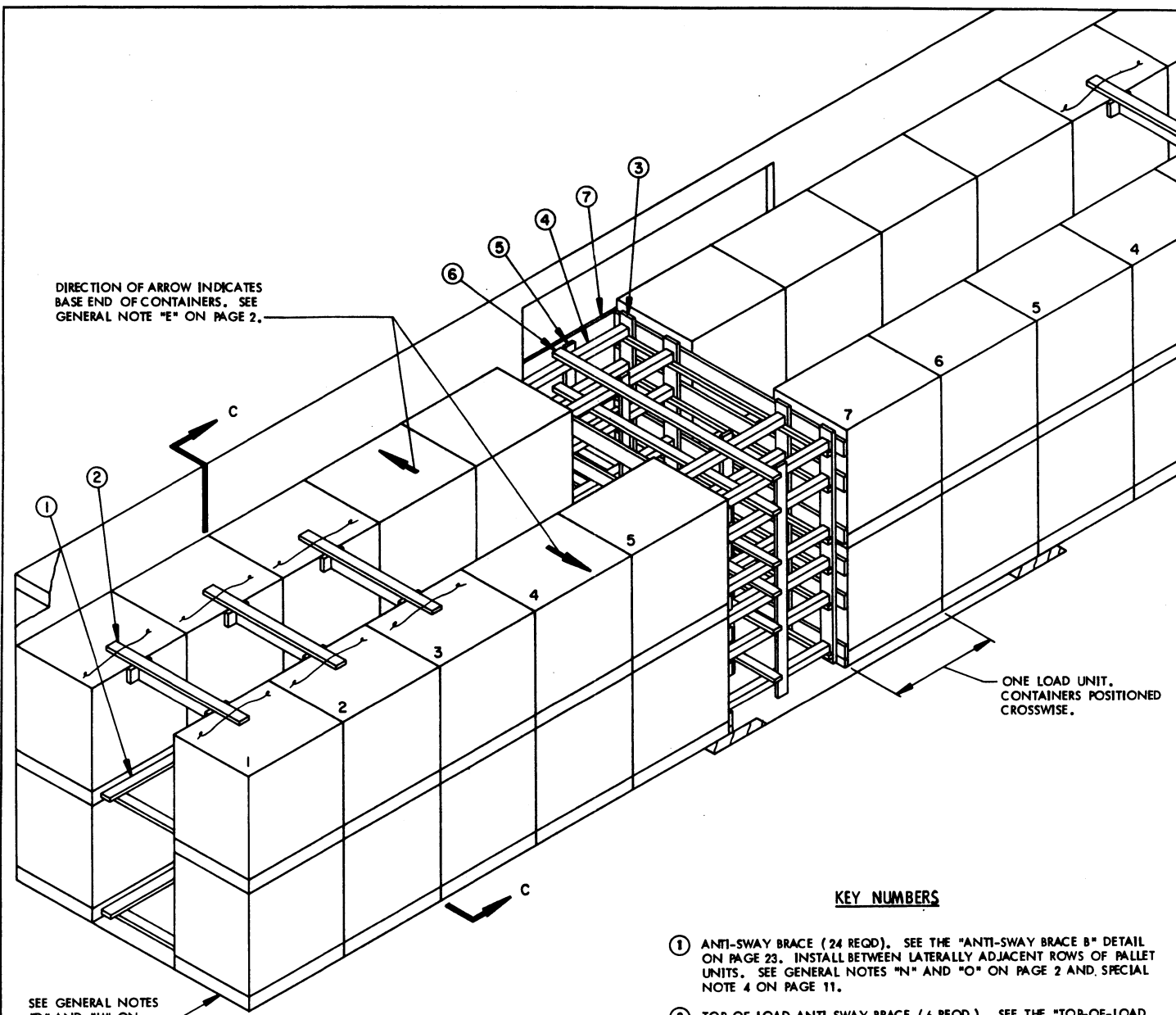
1. A 50'-6" LONG BY 9'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-11" MINIMUM WIDTH) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
2. A MAXIMUM OF SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 92,400 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG BY 9'-2" OR WIDER CAR IS AVAILABLE, NINETY (90) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 138,600 POUNDS CAN BE LOADED, LOAD LIMIT OF THE CAR PERMITTING.
3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD WHEN NECESSARY, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX (6) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
4. THE "HIGH" CRIB, SHOWN AS PIECE MARKED (1), MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A 50'-6" OR 40'-6" LONG CAR. IF THE CAR FURNISHED FOR LOADING IS 9'-1" OR NARROWER, THE HIGH AND LOW CRIB FILL, PIECES MARKED (1) AND (3), AND THE CRIB FILL STOP PIECES, PIECES MARKED (2) AND (4), WILL NOT BE REQUIRED.
5. CRIB FILL STOP PIECES, PIECES MARKED (2) AND (4), ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED (1) AND (3), FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB FILL AND LOW CRIB FILL ARE ADJACENT TO EACH OTHER. THE STOP PIECES WILL BE APPLIED TO THE ENDS OF THE HORIZONTAL PIECES ON ONE SIDE OF AN APPLICABLE CRIB FILL IN LIEU OF THE FILL PIECES OF THE ASSEMBLY AT THAT LOCATION. CRIB FILL STOP PIECES WILL ALSO BE 2" X 4" MATERIAL FOR A 9'-4" WIDE CAR. SECURE BY NAILING THRU THE 1" X 4" HORIZONTAL PIECES OF THE CRIB FILL W/3-6d NAILS AT EACH JOINT. FOR A 9'-2" WIDE CAR, USE 1" X 4" MATERIAL AND NAIL TO THE 1" X 4" HORIZONTAL PIECES OF A CRIB FILL W/3-6d NAILS AT EACH JOINT AND CLINCH.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALLS IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED (1) THRU (4). MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, 2" X 4" AND 1" X 4" LAMINATED FOR 9'-4", AND DOUBLED 2" X 4" FOR A 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENINGS. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24" AND 2" X 4" FILL W/1-6d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING. UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. CENTER GATE "B", PIECE MARKED (5), WILL BE BUILT 9'-11/2" WIDE FOR CARS WHICH ARE 9'-2" OR GREATER IN WIDTH. THE GATES WILL BE CONSTRUCTED TO BE CAR WIDTH MINUS ONE-HALF INCH IN WIDTH FOR CARS LESS THAN 9'-2" WIDE, AND WILL HAVE THE VERTICAL PIECES PLACED AT 4" AND 27 1/2" FROM EACH END AND AT 37" AND 60-3/4" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS GIVEN ON THE DETAIL. RIGHT HAND AND LEFT HAND GATES WILL THEN BE REQUIRED. CENTER GATE "G", AS DETAILED ON PAGE 53, IS A "SPLIT GATE" FOR CONTAINERS-CROSSWISE LOADS BUT IT WILL NOT BE USED IN A 3-WIDE LOAD CONFIGURATION.
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 52 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
4" X 6"	80	40
2" X 2"	105	35
2" X 3"	31	16
2" X 4"	726	484
2" X 6"	206	206
4" X 4"	153	204
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	1000	15-1/2
12d (3-1/4")	32	3/4
16d (3-1/2")	144	3-1/4

LOAD AS SHOWN

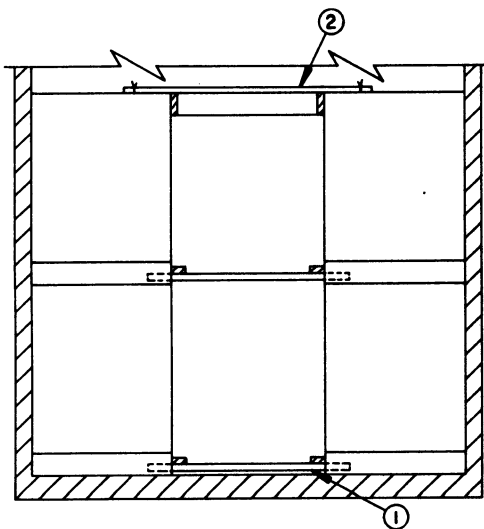
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNITS	72	110,880 LBS
DUNNAGE		1,990 LBS
TOTAL WEIGHT		112,870 LBS



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (24 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 23. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 11.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 24. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 51. SEE SPECIAL NOTE 5 ON PAGE 11.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 5. SEE SPECIAL NOTES 6, 7, AND 8 ON PAGE 11.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 51") (24 REQD). TOENAIL TO 1 PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" X 8'-0" (4 REQD). NAIL TO THE STRUTS, PIECE MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ HORIZONTAL STRUT BRACING, 2" X 4" X 9'-0" (6 REQD). NAIL TO THE STRUTS, PIECE MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 23. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 11.



SECTION C-C

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

(SPECIAL NOTES CONTINUED)

- 10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) 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 25 THRU 49 FOR GUIDANCE.
- 11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 47 AND 49 FOR SHIPPING GUIDANCE.
- 12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

SPECIAL NOTES:

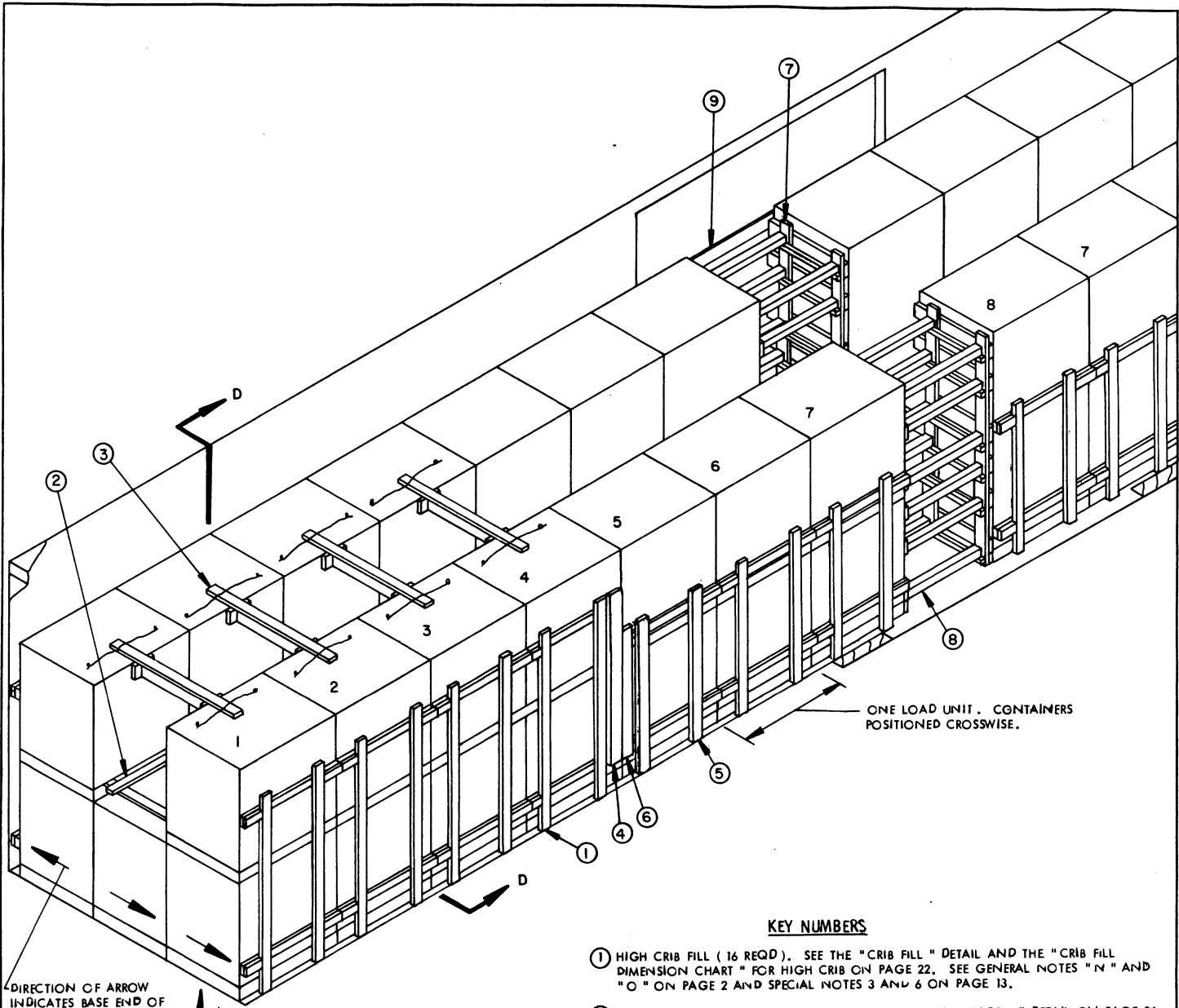
- 1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENING IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2 AND SPECIAL NOTE 3 BELOW.
- 2. A MAXIMUM OF SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 92,400 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY (40) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 61,600 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.
- 3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' THRU 10' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD WHEN NECESSARY, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX (6) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
- 4. IF THE ALTERNATIVE DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 18 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. SEE SPECIAL NOTE 9.
- 5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 51. THREE (3) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' LONG CARS; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.
- 6. 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 52 FOR GUIDANCE.
- 7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE C", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 10, INSTALL TWO (2) "CENTER GATES G" AS SHOWN ON PAGE 53. 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 52.
- 8. 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 54 FOR GUIDANCE.
- 9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (7) IN THE LOAD ON PAGE 10, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 55 THRU 57 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 18. SEE THE "STRAPPING BOARD ASSEMBLY A" DETAIL ON PAGE 21. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	108	36
2" X 3"	31	16
2" X 4"	487	325
2" X 6"	232	232
4" X 4"	102	136
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	922	14-1/4
12d (3-1/4")	32	3/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----60' REQD-----1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	48-----	73,920 LBS
DUNNAGE-----	-----	1,589 LBS
TOTAL WEIGHT-----		75,509 LBS



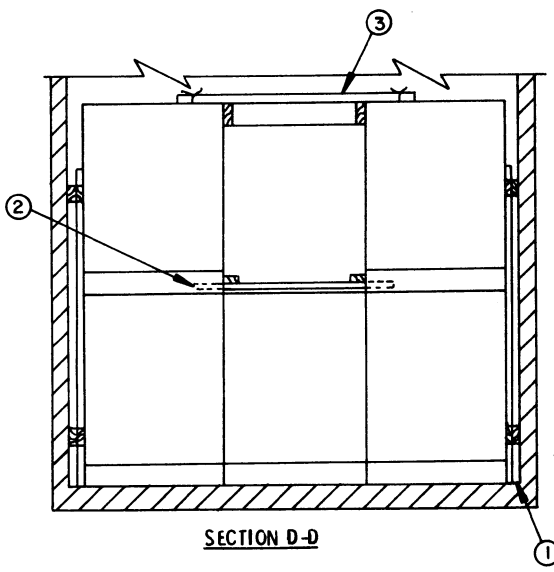
ISOMETRIC VIEW

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

ONE LOAD UNIT. CONTAINERS POSITIONED CROSSWISE.

KEY NUMBERS

- ① HIGH CRIB FILL (16 REQD). SEE THE "CRIB FILL " DETAIL AND THE "CRIB FILL DIMENSION CHART " FOR HIGH CRIB ON PAGE 22. SEE GENERAL NOTES "M " AND "O " ON PAGE 2 AND SPECIAL NOTES 3 AND 6 ON PAGE 13.
- ② ANTI-SWAY BRACE (15 REQD). SEE THE "ANTI-SWAY BRACE B " DETAIL ON PAGE 23. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B " DETAIL ON PAGE 24. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B " DETAIL ON PAGE 51. SEE SPECIAL NOTE 4 ON PAGE 13.
- ④ HIGH CRIB FILL STOP PIECE, 2" X 4" X 72" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES OF THE HIGH CRIB, PIECE MARKED ①, BY NAILING TO THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 13.
- ⑤ LOW CRIB FILL (14 REQD). SEE THE "CRIB FILL " DETAIL AND THE "CRIB FILL DIMENSION CHART " FOR LOW CRIB ON PAGE 22.
- ⑥ LOW CRIB FILL STOP PIECE, 2" X 4" X 54" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 13.
- ⑦ CENTER GATE (2 REQD). SEE THE "CENTER GATE D " DETAIL ON PAGE 23. SEE SPECIAL NOTES 7, 8 AND 9 ON PAGE 13.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT (REF: 35-3/4") (30 REQD). TORNAIL TO PIECE MARKED ⑦ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "M " AND "V " ON PAGE 2 AND "W " ON PAGE 3.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B " DETAIL ON PAGE 23. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 13.



SECTION D-D

75-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 12, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 55 THRU 57 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 18. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.
11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY A MULTIPLE OF FIVE (5) PALLET UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. THE ENTIRE TOP TIER CAN BE OMITTED, OR MULTIPLES OF THREE (3) PALLET UNITS CAN BE OMITTED FROM A ONE-LAYER LOAD. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 25 THRU 49 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 47 AND 49 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-1" MINIMUM WIDTH) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. USING THE DEPICTED PROCEDURES, A MAXIMUM OF SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 92,400 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR; FIFTY (50) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 77,000 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR.
3. THE "HIGH" CRIB FILL, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A 50'-6" OR 40'-6" LONG CAR. IF THE CAR FURNISHED FOR LOADING IS 9'-1" OR NARROWER, THE HIGH AND LOW CRIB FILL, PIECES MARKED ① AND ⑤, AND THE CRIB FILL STOP PIECES, PIECES MARKED ④ AND ⑥, WILL NOT BE REQUIRED.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 12, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSS PIECES OF THE TOP PUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE WIRE APPLICATION B" DETAIL ON PAGE 51. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR AND THREE (3) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' LONG CAR.
5. CRIB FILL STOP PIECES, PIECES MARKED ④ AND ⑥, ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED ① AND ⑤ FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB FILL AND LOW CRIB FILL ARE ADJACENT TO EACH OTHER. THE STOP PIECES WILL BE APPLIED TO THE ENDS OF THE HORIZONTAL PIECES ON ONE SIDE OF AN APPLICABLE CRIB FILL IN LIEU OF THE FILL PIECES OF THE ASSEMBLY AT THAT LOCATION. CRIB FILL STOP PIECES WILL ALSO BE 2" X 4" MATERIAL FOR A 9'-4" WIDE CAR. SECURE BY NAILING THRU THE 1" X 4" HORIZONTAL PIECES OF THE CRIB FILL W/3-6d NAILS AT EACH JOINT. FOR A 9'-2" WIDE CAR, USE 1" X 4" MATERIAL AND NAIL TO THE 1" X 4" HORIZONTAL PIECES OF A CRIB FILL W/3-6d NAILS AT EACH JOINT AND CLINCH.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALLS IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED ①, ④, ⑤, AND ⑥. MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, 2" X 4" AND 1" X 4" LAMINATED FOR 9'-4" WIDE, AND DOUBLED 2" X 4" FOR A 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENING. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24" AND 2" X 4" FILL W/1-10d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. CENTER GATE "D", PIECE MARKED ⑦, WILL BE BUILT 9'-4-1/2" WIDE FOR CARS WHICH ARE 9'-2" OR GREATER IN WIDTH. THE GATES WILL BE CONSTRUCTED TO BE CAR WIDTH MINUS ONE-HALF INCH IN WIDTH FOR CARS LESS THAN 9'-2" WIDE, AND WILL HAVE THE VERTICAL PIECES PLACED AT 4" AND 27-1/2" FROM EACH END AND AT 37" AND 60-3/4" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS GIVEN ON THE DETAIL. RIGHT HAND AND LEFT HAND GATES WILL THEN BE REQUIRED. CENTER GATE "G", AS DETAILED ON PAGE 53, IS A "SPLIT GATE" FOR CONTAINERS-CROSSWISE LOADS BUT IT WILL NOT BE USED IN A 3-WIDE LOAD CONFIGURATION.
8. CENTER GATE "D" 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 52 FOR GUIDANCE.
9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "D", PROVIDING THE CAR BEING LOADED IS 9'-2" OR LESS IN WIDTH AND ALSO PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 54 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	85	29
2" X 3"	31	16
2" X 4"	982	655
2" X 6"	208	208
4" X 4"	90	120
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	1120	17-1/4
12d (3-1/4")	32	3/4
16d (3-1/2")	120	2-3/4
WIRE, NO. 14 GAGE-----60' REQD-----1 LB		

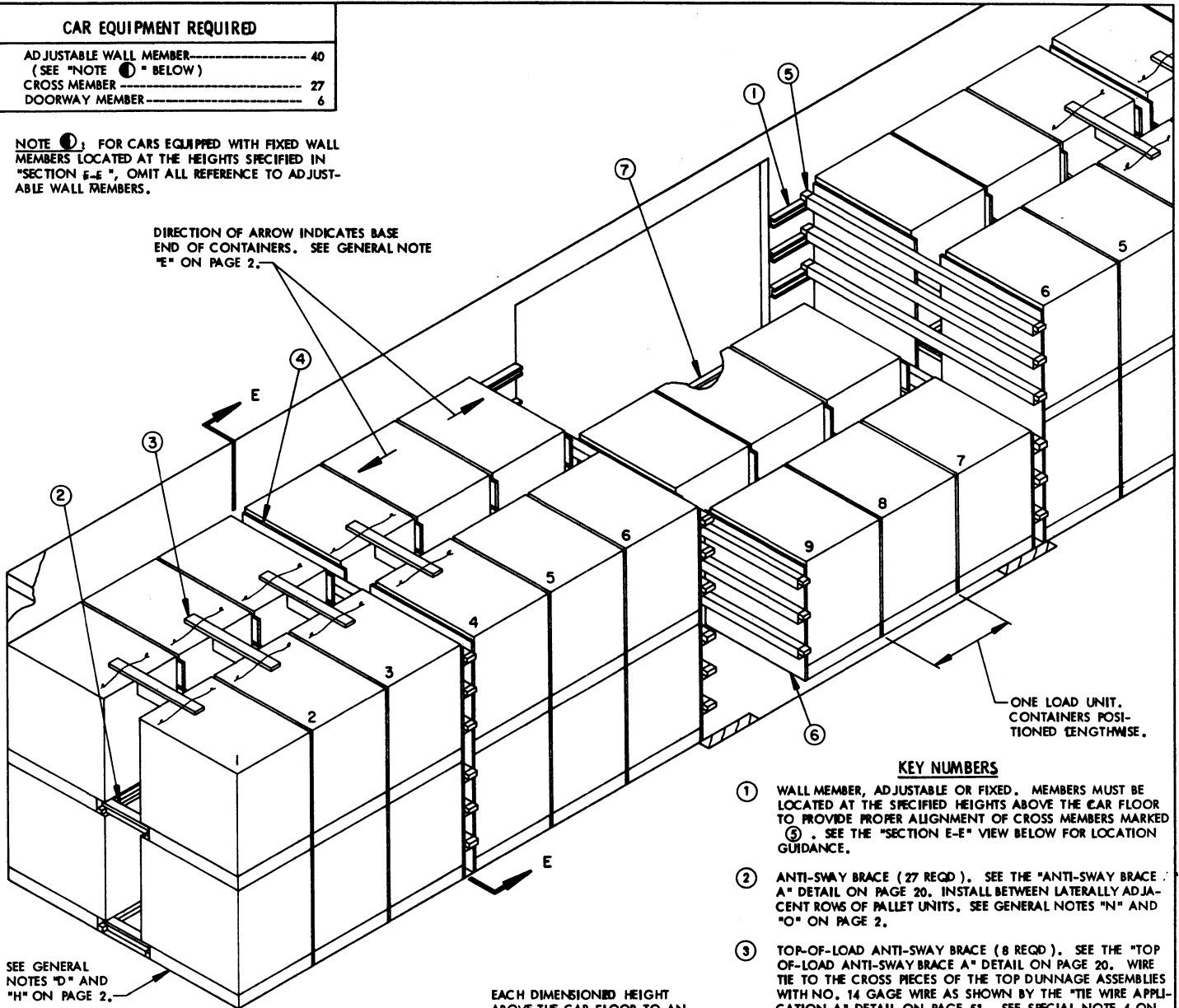
ITEM	LOAD AS SHOWN QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	75-----	115,500 LBS
PUNNAGE-----	-----	2,159 LBS
TOTAL WEIGHT-----		117,659 LBS

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER-----	40
(SEE "NOTE 1" BELOW)	
CROSS MEMBER-----	27
DOORWAY MEMBER-----	6

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

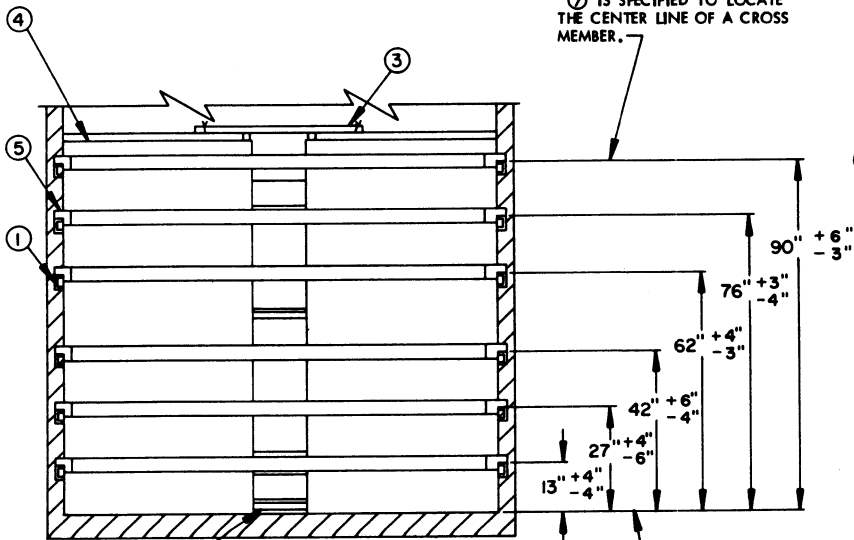
DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS. SEE GENERAL NOTE "E" ON PAGE 2.



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

ISOMETRIC VIEW

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



SECTION E-E

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 E-E" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (27 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLIES WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51. SEE SPECIAL NOTE 4 ON PAGE 15.
- ④ SEPARATOR GATE FOR 2-HIGH (14 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20. SEE SPECIAL NOTE 5 ON PAGE 15.
- ⑤ CROSS MEMBER (27 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH (4 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20.
- ⑦ DOORWAY MEMBER (6 REQD). SEE THE "SECTION E-E" VIEW AT LEFT FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 7 ON PAGE 15.

SPECIAL NOTES:

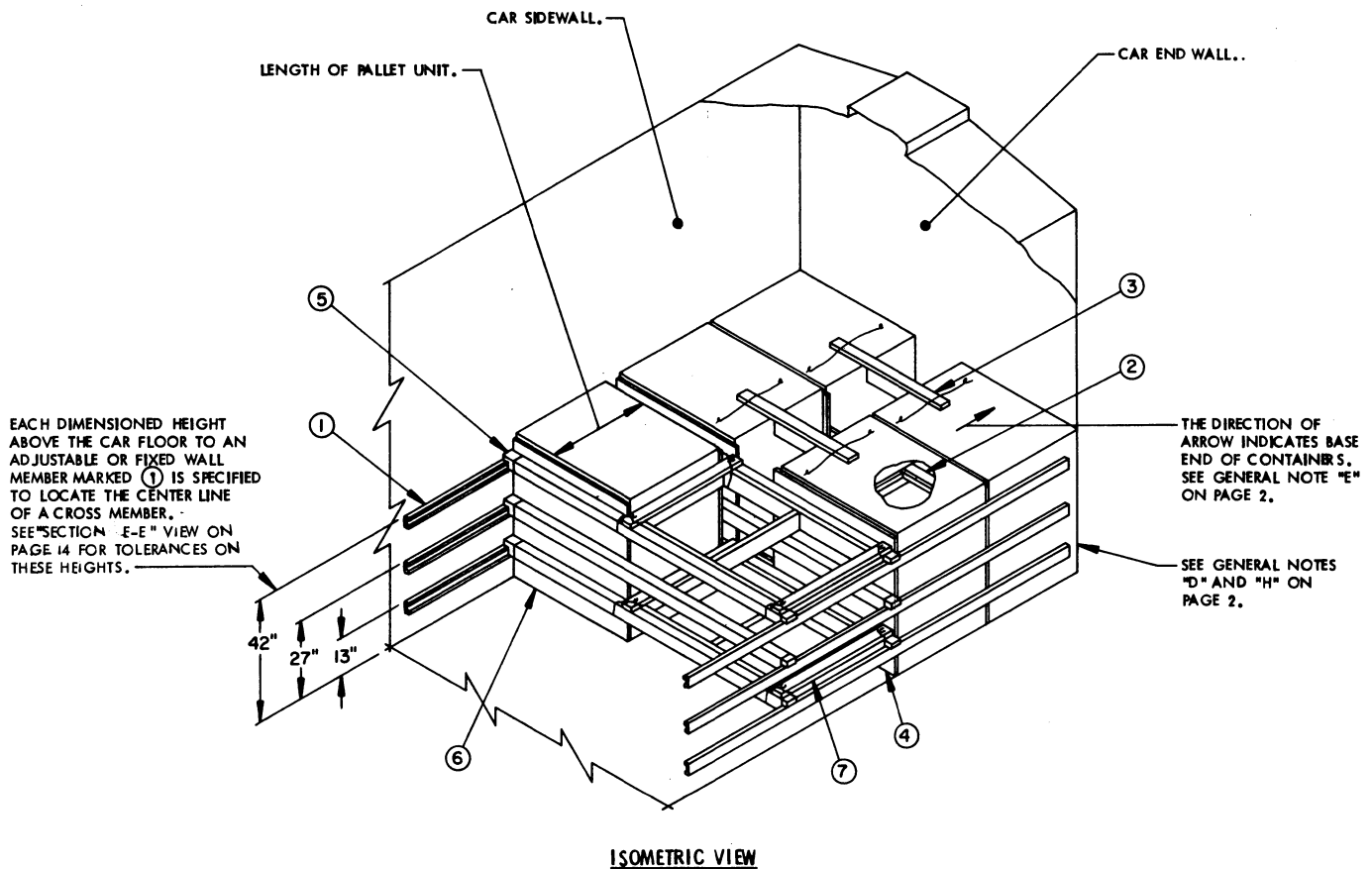
1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
2. A MAXIMUM OF FORTY-SIX (46) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 70,840 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR.
3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE SHOWN AS PIECE MARKED (4), MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (3) IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSSPIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 40' OR 50' LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR.
5. TO FACILITATE POSITIONING OF THE PALLET UNITS AS LOADING PROGRESSES, POSITION PALLET UNIT STACKS AGAINST THE END WALL, THEN POSITION A SEPARATOR GATE SHOWN AS PIECES MARKED (4) SO THE 1" X 6" TIE PIECES ARE TOWARD THE ALREADY LOADED PALLET UNITS. REPEAT THIS PROCEDURE FOR THE REMAINING STACKS.
6. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24.
7. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AN ADDITIONAL SIX PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.
8. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 16 AND 17 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	107	36
1" X 6"	57	29
2" X 2"	159	53
2" X 4"	130	87
2" X 6"	11	11
NAILS	NO. REQD	POUNDS
6d (2")	594	1-1/2
10d (3")	216	3-1/2
12d (3-1/4")	24	1/2
PLYWOOD, 4" X 8' X 3/8" THICK-----28 REQD----- 924 LBS		
PLYWOOD, 4" X 4' X 3/8" THICK----- 8 REQD----- 132 LBS		
WIRE, NO. 14 GAGE-----96' REQD----- 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	54	83,160 LBS
DUNNAGE		1,496 LBS
TOTAL WEIGHT		84,656 LBS (APPROX)



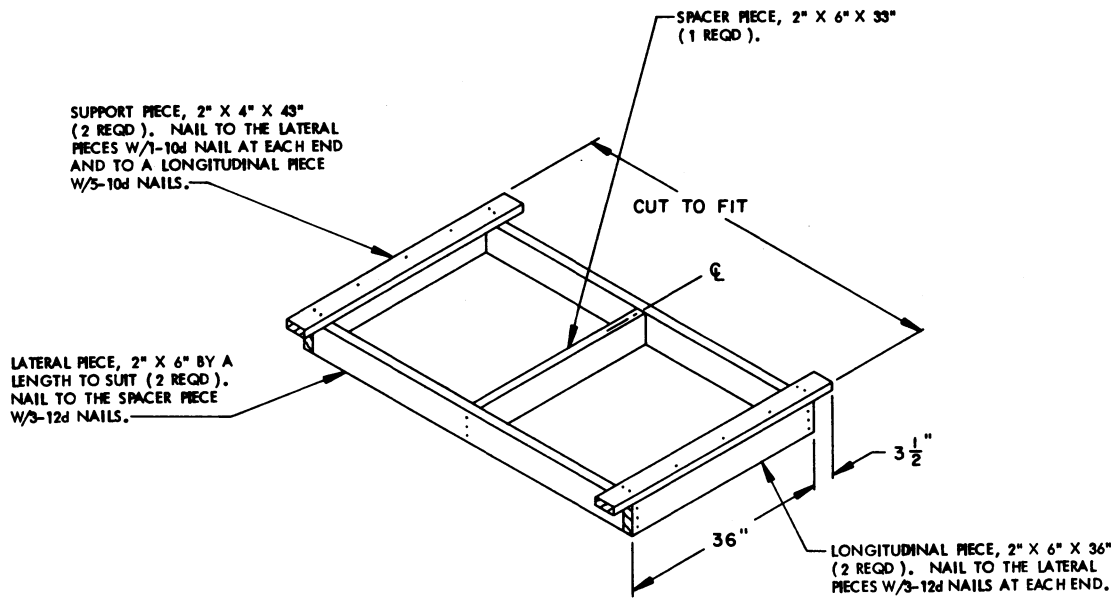
SPECIAL NOTES:

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 PIECE MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 40' AND 50' LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60'-8" LONG CAR.
4. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24.
5. THE SPACER ASSEMBLIES, SHOWN AS PIECE MARKED ⑦, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

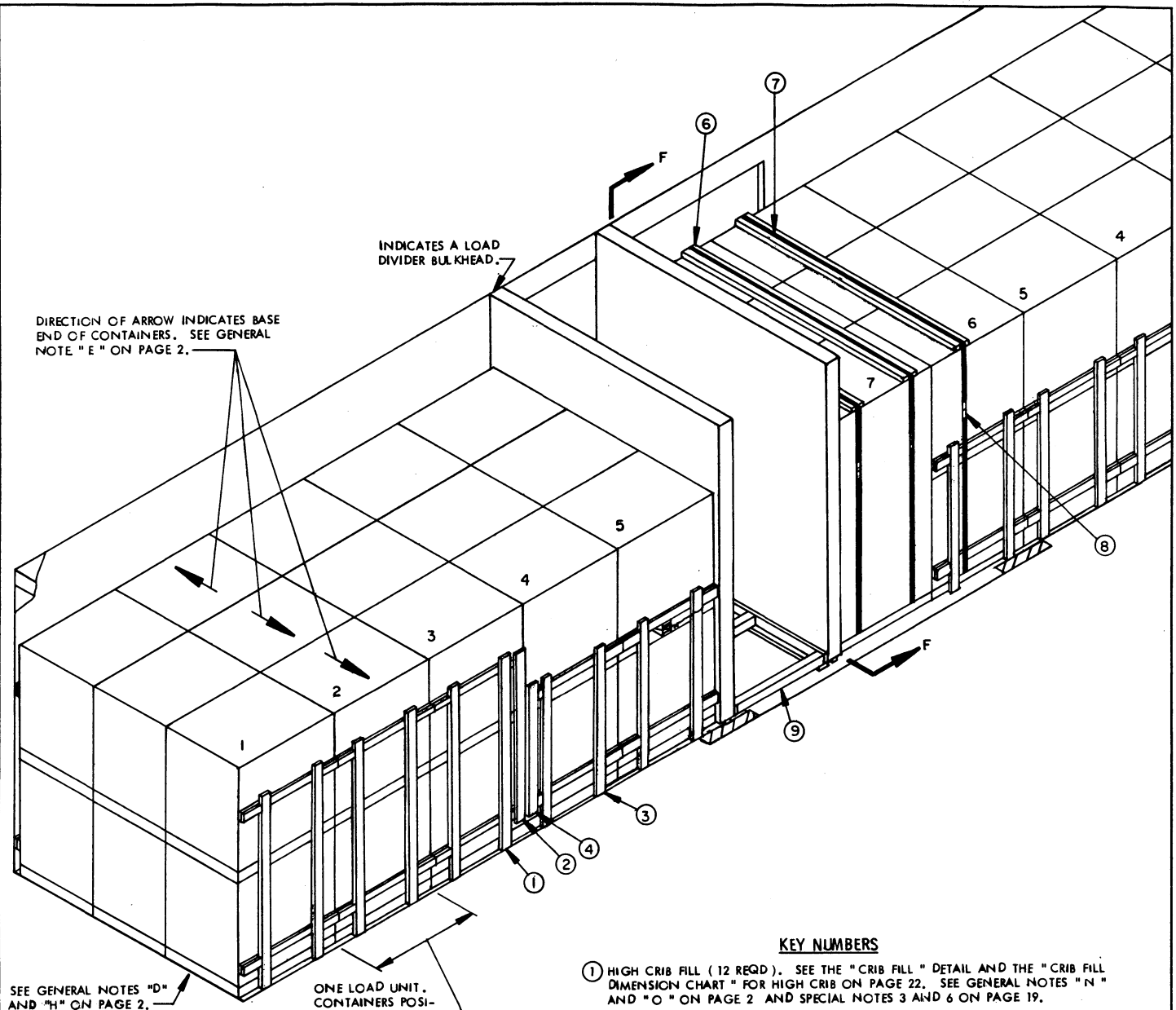
KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51.
- ④ SEPARATOR GATE FOR 1-HIGH AND 2-WIDE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20.
- ⑤ CROSS MEMBER (6 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑥ SEPARATOR GATE FOR 1-HIGH AND 1-WIDE, PLYWOOD, 3/8" THICK, 45-3/4" WIDE BY 48" HIGH (2 REQD).
- ⑦ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 17 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

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



SPACER ASSEMBLY



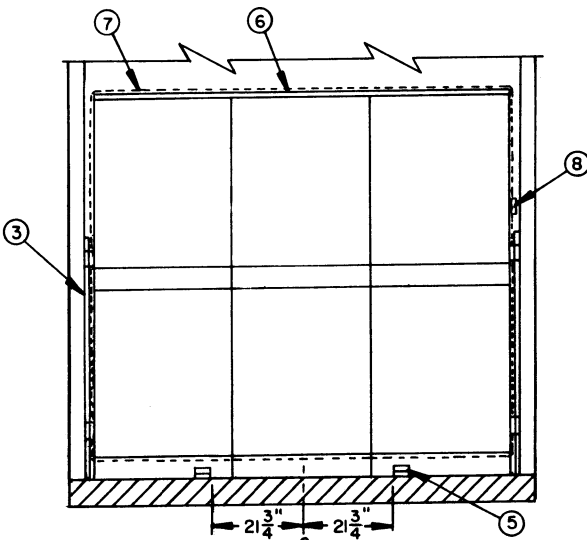
ISOMETRIC VIEW

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

ONE LOAD UNIT, CONTAINERS POSITIONED CROSSWISE.

KEY NUMBERS

- ① HIGH CRIB FILL (12 REQD). SEE THE "CRIB FILL" DETAIL AND THE "CRIB FILL DIMENSION CHART" FOR HIGH CRIB ON PAGE 22. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTES 3 AND 6 ON PAGE 19.
- ② HIGH CRIB FILL STOP PIECE, 1" X 4" X 72" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES OF THE HIGH CRIB, PIECE MARKED ①, W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 4 ON PAGE 19.
- ③ LOW CRIB FILL (12 REQD). SEE THE "CRIB FILL" DETAIL AND THE "CRIB FILL DIMENSION CHART" FOR LOW CRIB ON PAGE 22. SEE SPECIAL NOTE 5 ON PAGE 19.
- ④ LOW CRIB FILL STOP PIECE, 1" X 4" X 54" (4 REQD). SECURE TO THE ENDS OF THE HORIZONTAL PIECES OF THE LOW CRIB, PIECE MARKED ③, BY NAILING THRU THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. SEE SPECIAL NOTE 4 ON PAGE 19.
- ⑤ DOORWAY BLOCKING, 2" X 4" X 36" (DOUBLED) (4 REQD). PRE-POSITION AS SHOWN IN "SECTION F-F" AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE IN A LIKE MANNER. SEE SPECIAL NOTE 7 ON PAGE 19.
- ⑥ STRAPPING BOARD, 2" X 6" X 8'-9" (3 REQD).
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" X .035" OR .031" X 36'-0" LONG STEEL STRAPPING (3 REQD). STAPLE TO THE STRAPPING BOARD, PIECE MARKED ⑥, W/3 STAPLES. SEE SPECIAL NOTE 8 ON PAGE 19.
- ⑧ SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PFR STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑨ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 58. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 9 ON PAGE 19.



SECTION F-F

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

(SPECIAL NOTES CONTINUED)

8. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM SIX INCHES (6") TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.
9. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑨ IN THE LOAD ON PAGE 18, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR CONSISTS OF MORE THAN FIVE (5) LOAD UNITS. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60' OR LONGER CARS.
10. WHEN PALLET UNITS ARE LOADED WITH THE CONTAINERS LENGTHWISE IN THE CAR, THE BLOCKING AND BRACING DUNNAGE WILL BE DIFFERENT THAN THAT SHOWN. USE THE ANTI-SWAY BRACES, TOP-OF-LOAD ANTI-SWAY BRACES AND SEPARATOR GATES, SHOWN AS PIECES MARKED ①, ② AND ③ ON PAGE 6. SIDE BLOCKING (2" X 4" X 35-1/4"), "STRAPPING BOARD ASSEMBLY A", AS DETAILED ON PAGE 21, AND DOORWAY PROTECTION STRAPS AND SEALS WILL ALSO BE REQUIRED. THE DOORWAY PROTECTION STRAPS WILL BE 36'-0" LONG.
11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF THREE (3) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. THE ENTIRE TOP TIER CAN BE OMITTED, OR THE TOP TIER OF JUST THE MIDDLE ROW CAN BE OMITTED AS SHOWN IN THE LOAD ON PAGE 12. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 25 THRU 49 AND GENERAL NOTE "GG" ON PAGE 3 FOR GUIDANCE.
12. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 47 AND 49 FOR SHIPPING GUIDANCE.
13. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 48 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-11" MINIMUM WIDTH) AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "HH" ON PAGE 3.
2. A MAXIMUM OF NINETY (90) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 138, 600 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR OR A MAXIMUM OF FIFTY-FOUR (54) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 83,160 POUNDS WHEN USING THE DEPICTED PROCEDURES. PALLET UNITS MAY ALSO BE LOADED WITH THE CONTAINERS ON THE PALLET UNIT POSITIONED LENGTHWISE IN LIEU OF CROSSWISE AS SHOWN. THE FOLLOWING LOADS CAN BE ACHIEVED WHEN THE CONTAINERS ARE POSITIONED LENGTHWISE: 60'-8" CAR, SEVENTY-SIX (76) UNITS, APPROXIMATELY 117,040 POUNDS; 50'-6" CAR, SIXTY-FOUR (64) UNITS, APPROXIMATELY 98,560 POUNDS; 40'-6" CAR, FORTY-EIGHT (48) UNITS, APPROXIMATELY 73,920 POUNDS. NOTE THAT A LOAD OF LENGTHWISE CONTAINERS IN A 50'-6" LONG CAR WILL BE LIMITED TO SIXTY (60) UNITS UNLESS THE LOAD DIVIDER BULKHEADS ARE EQUIPPED WITH THE OPERATING MECHANISM ON THE EDGE OF THE BULKHEAD. REFER TO SPECIAL NOTE 10 FOR LOADING GUIDANCE FOR LOADS OF LENGTHWISE CONTAINERS.
3. THE HIGH CRIB FILL, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A 50'-6" OR 40'-6" LONG CAR. IF THE CAR FURNISHED FOR LOADING IS 9'-4" OR NARROWER, THE HIGH AND LOW CRIB FILL, PIECES MARKED ① AND ③, AND THE CRIB FILL STOP PIECES, PIECES MARKED ② AND ④, WILL NOT BE REQUIRED.
4. CRIB FILL STOP PIECES, PIECES MARKED ② AND ④, ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED ① AND ③, FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB AND LOW CRIB ARE ADJACENT TO EACH OTHER. THE STOP PIECES WILL BE APPLIED TO THE ENDS OF THE HORIZONTAL PIECES ON ONE SIDE OF AN APPLICABLE CRIB FILL IN LIEU OF THE FILL PIECES OF THE ASSEMBLY AT THAT LOCATION. CRIB FILL STOP PIECES WILL BE 2" X 4" FOR 9'-4" AND 9'-6" WIDE CARS. FOR 9'-4" WIDE CARS, SECURE BY NAILING THRU THE 1" X 4" HORIZONTAL PIECES OF A CRIB FILL INTO THE STOP PIECE W/3-6d NAILS AT EACH JOINT; FOR A 9'-6" WIDE CAR, NAIL THE STOP PIECE TO THE 2" X 4" HORIZONTAL PIECES W/2-0d NAILS AT EACH JOINT.
5. LOW CRIB FILL ASSEMBLIES ARE TO BE INSTALLED AT THE SIDES OF ALL LOAD UNITS IN THE CENTER PORTION OF THE LOAD UNLESS THE LOAD UNIT IS COMPLETELY WITHIN THE DOOR OPENING. THE LAST LOW CRIB FILL TO BE INSTALLED ON EACH END AND SIDE OF THE LOAD MUST BE WIRE TIED TO PREVENT DISPLACEMENT. WITH NO. 14 GAGE OR HEAVIER WIRE, ENIRCLE THE CENTER POST OF THE ADJACENT SECOND-LAYER PALLET AND THE VERTICAL PIECE OF THE CRIB FILL WHICH IS NEAREST THE CENTER OF THE CAR AND TWIST TAUT. NOTE THAT DEPENDING UPON THE WIDTH OF THE CAR DOOR IT MAY BE NECESSARY TO FASTEN THE WIRE AROUND THE PALLET POST PRIOR TO PLACEMENT OF THE PALLET UNIT. IF THE LAST CRIB FILL IN AN END HAS A DOORWAY PROTECTION STRAP, PIECE MARKED ⑦, EXTENDING OVER IT THE WIRE TIE IS NOT REQUIRED.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALL IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED ① THRU ④. MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, 2" X 4" AND 1" X 4" LAMINATED FOR 9'-4", AND DOUBLE 2" X 4" FOR A 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENING. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24". AND 2" X 4" FILL W/1-10d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. 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 NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAP PROCEDURE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑤ THRU ⑧ IN THE LOAD ON PAGE 18, IS APPLICABLE FOR BOX CARS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR PLUG DOOR CARS CAN ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	602	204
1" X 8"	17	12
2" X 4"	66	44
2" X 6"	27	27
4" X 4"	14	20
NAILS	NO. REQD	POUNDS
6d (2")	546	3-1/4
10d (3")	18	1/2
12d (3-1/4")	16	1/2
16d (3-1/2")	40	1
STEEL STRAPPING, 1 1/4" X .031" OR .035"---108 REQD---16 LBS		
SEAL FOR 1-1/4" STRAPPING-----6 REQD---NIL		
STAPLE FOR 1-1/4" STRAPPING-----9 REQD---NIL		
NO. 14 GAGE WIRE-----5 REQD---NIL		

ITEM	LOAD AS SHOWN QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	72-----	110,880 LBS
DUNNAGE-----	-----	630 LBS
TOTAL WEIGHT-----		111,510 LBS

72-UNIT IN A 50'-6" LONG BY 9'-2" WIDE BOXCAR EQUIPPED WITH LOAD DIVIDERS

BUFFER PIECE, 2" X 2" X 35" (2 REQD.), NAIL TO THE SPACER PIECES W/2-10d NAILS AT EACH JOINT.

TIE PIECE, 1" X 4" BY LENGTH TO SUIT (2 REQD.), NAIL TO THE BUFFER PIECES W/2-6d NAILS AT EACH END AND TO THE SPACER PIECE W/3-6d NAILS.

VOID BETWEEN PALLET POSTS MINUS 1/2".

1 1/2"

SPACER PIECE, 2" X 4" BY CUT TO FIT (2 REQD.).

ANTI-SWAY BRACE A

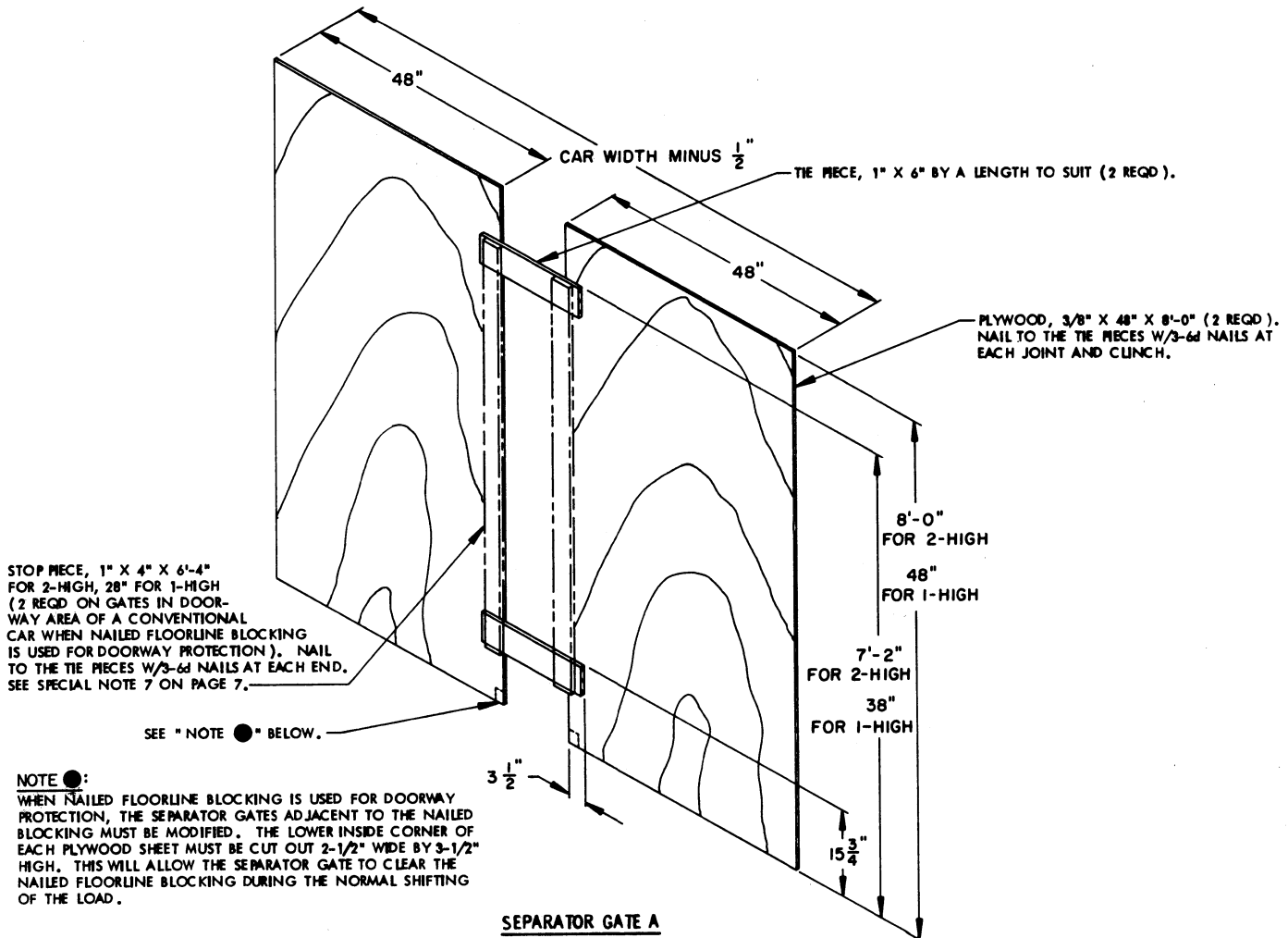
THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 6 AND 14.

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD.), NAIL TO THE SPACER PIECE W/3-12d NAILS.

SPACER PIECE, 2" X 6" BY CUT TO FIT BETWEEN LATERALLY ADJACENT PALLET UNITS MINUS 1/4" (1 REQD.), POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE.

TOP-OF-LOAD ANTI-SWAY BRACE A

THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 6 AND 14.



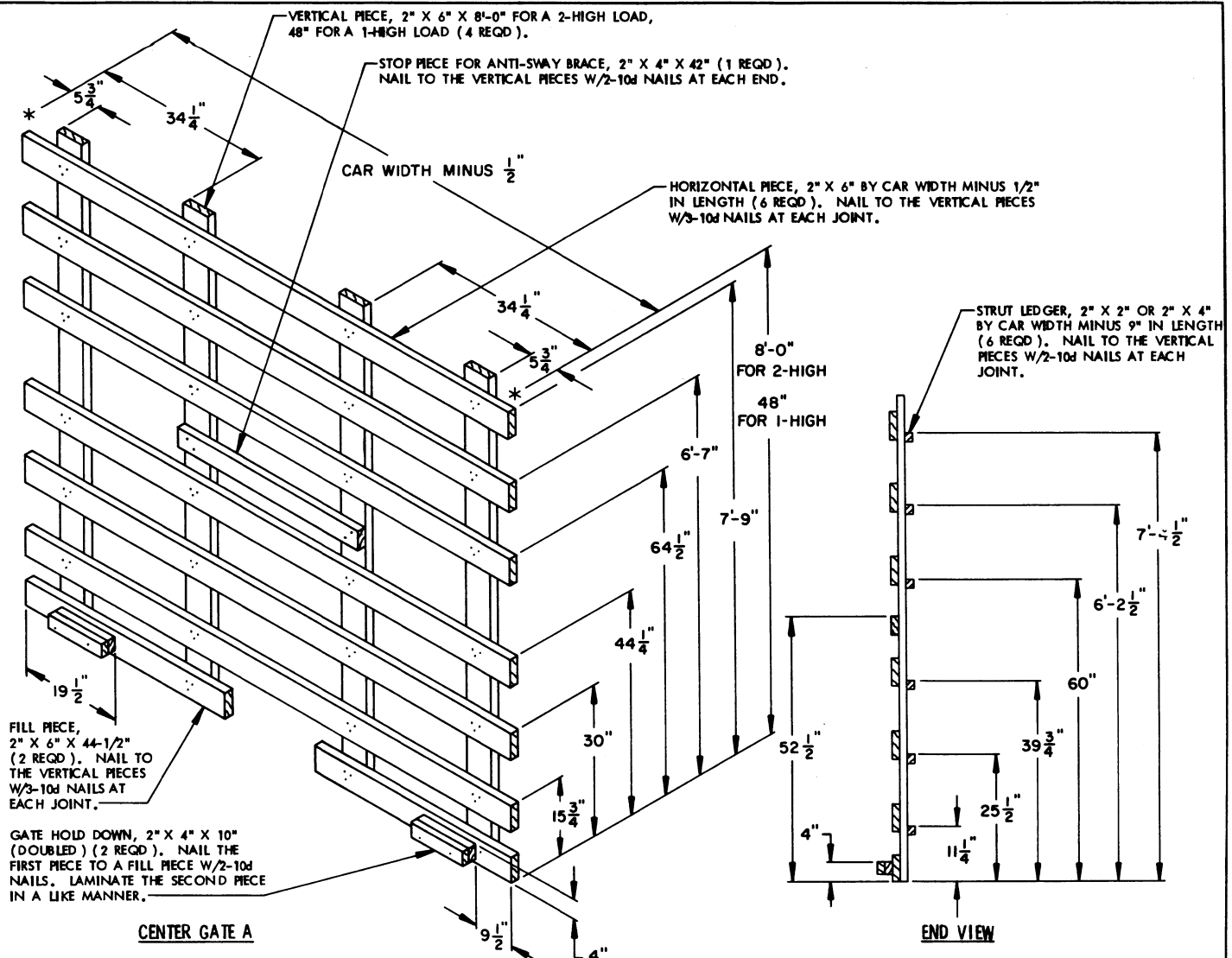
STOP PIECE, 1" X 4" X 6'-4" FOR 2-HIGH, 28" FOR 1-HIGH (2 REQD ON GATES IN DOORWAY AREA OF A CONVENTIONAL CAR WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION). NAIL TO THE TIE PIECES W/3-6d NAILS AT EACH END. SEE SPECIAL NOTE 7 ON PAGE 7.

SEE "NOTE" BELOW.

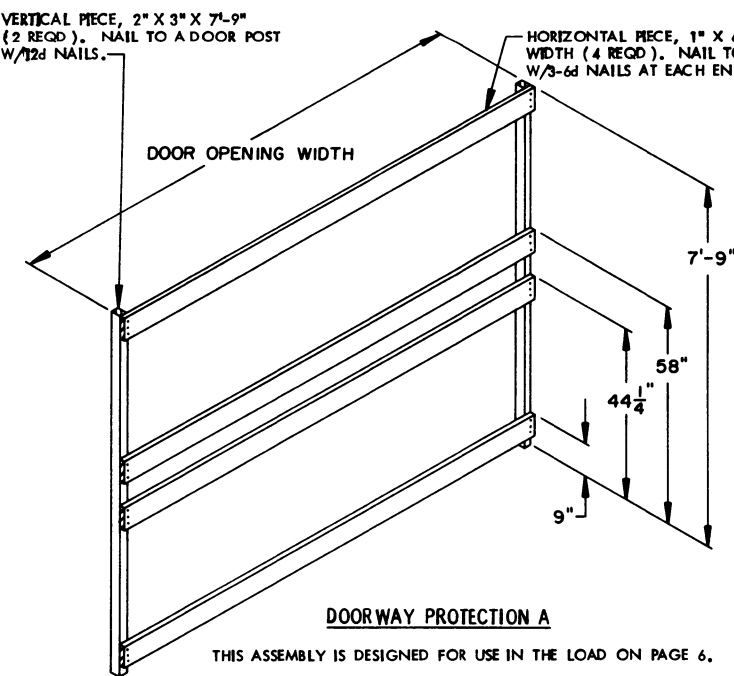
NOTE: WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE SEPARATOR GATES ADJACENT TO THE NAILED BLOCKING MUST BE MODIFIED. THE LOWER INSIDE CORNER OF EACH PLYWOOD SHEET MUST BE CUT OUT 2-1/2" WIDE BY 3-1/2" HIGH. THIS WILL ALLOW THE SEPARATOR GATE TO CLEAR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD.

SEPARATOR GATE A

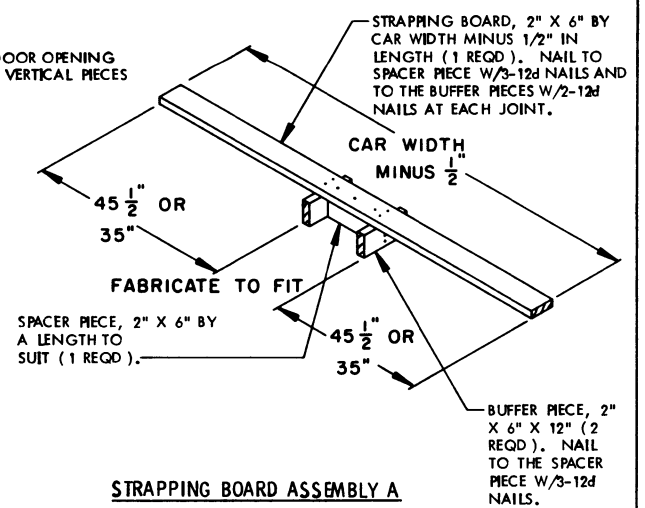
THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS ON PAGES 6 AND 14.



THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 6. GATE DESIGN FOR PROTECTIVE USE OF PLUG DOOR CARS.



THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOAD ON PAGE 6.



THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 6, 10, AND 12 WHEN THE DOORWAY PROTECTION PROCEDURES FOR PLUG DOOR CARS ARE USED.

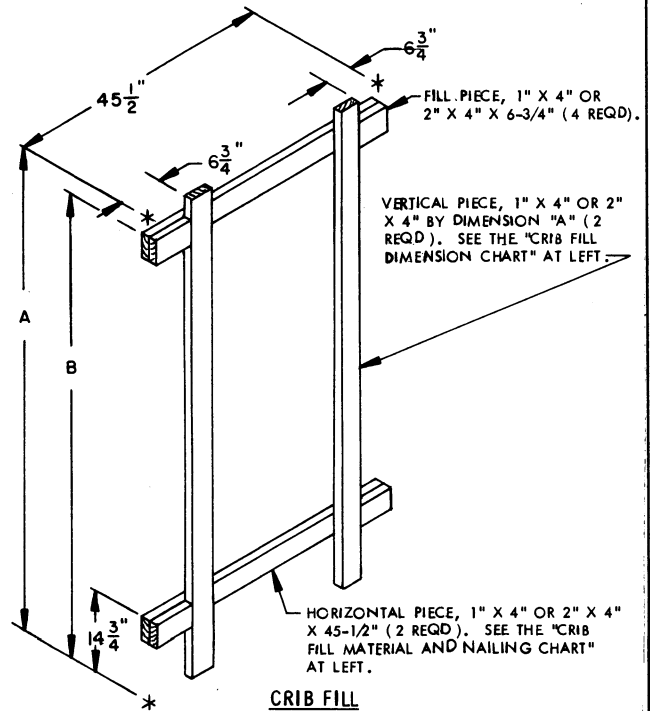
CRIB FILL MATERIAL AND NAILING CHART

PIECE	CAR WIDTH		
	9'-2"	9'-4"	9'-6"
VERTICAL	1" X 4"	2" X 4"	2" X 4"
HORIZONTAL	1" X 4 W/3-6d NAILS EACH JOINT, CLINCHED.	1" X 4" W/3-6d NAILS EACH JOINT	2" X 4" W/2-10d NAILS EACH JOINT
FILL	1" X 4" W/2-6d NAILS, CLINCHED.	2" X 4" W/3-6d NAILS	2" X 4" W/2-10d NAILS.

CRIB FILL DIMENSION CHART

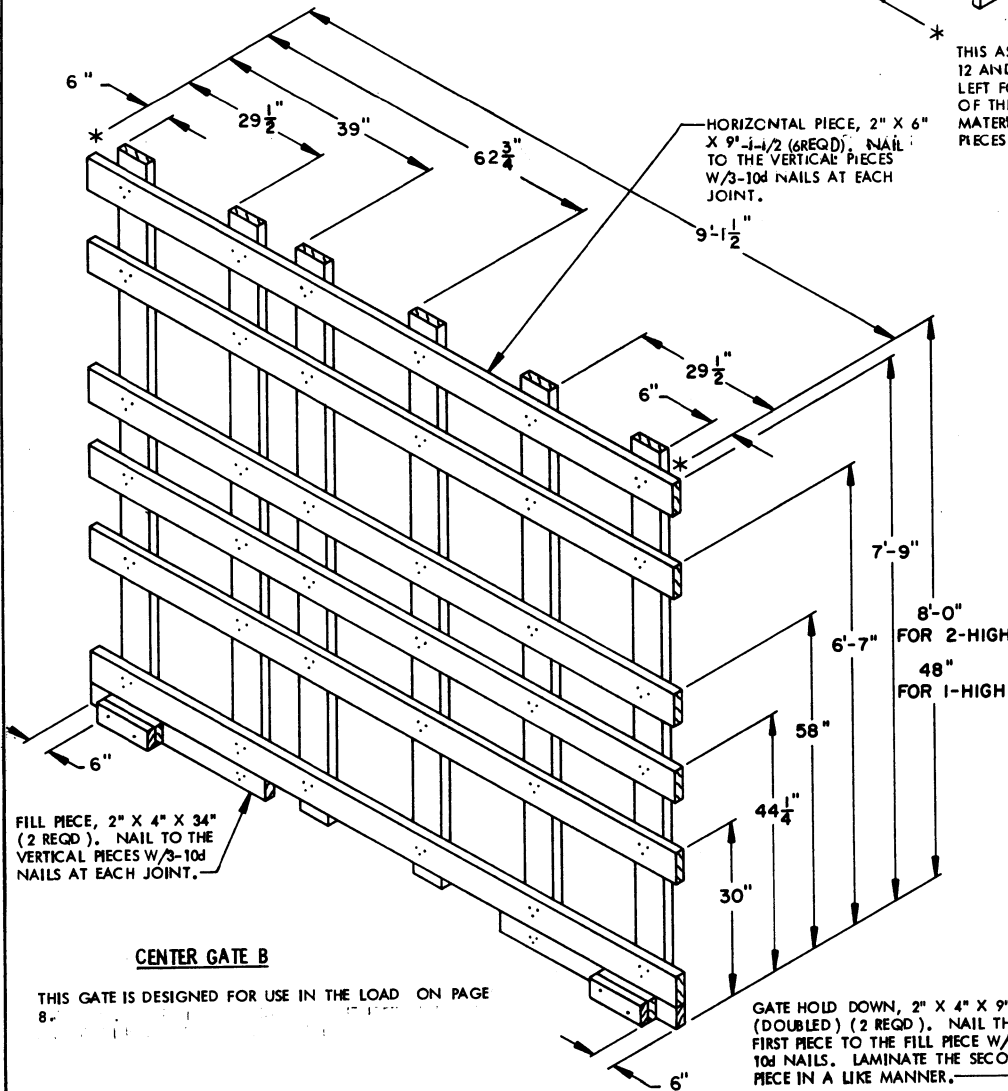
CRIB FILL	LOAD	DIM A	DIM B
HIGH CRIB	2-HIGH LOAD	6'-9"	6'-6"
	1-HIGH	39"	36"
LOW CRIB	2-HIGH LOAD	62"	59"

A LOW CRIB IS NOT REQUIRED FOR A 1-HIGH LOAD: USE A 1-HIGH HIGH CRIB FILL THROUGHOUT THE LENGTH OF THE LOAD.



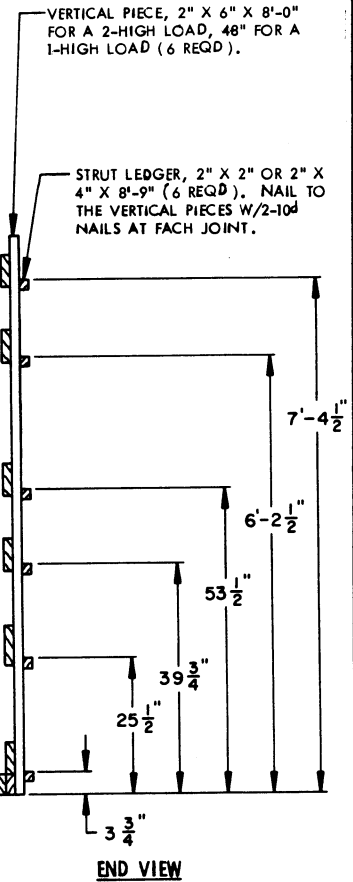
CRIB FILL

THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 8, 12 AND 18. SEE THE "CRIB FILL DIMENSION CHART" AT LEFT FOR LENGTH OF THE VERTICAL PIECES AND PLACEMENT OF THE UPPER HORIZONTAL PIECES. SEE THE "CRIB FILL MATERIAL AND NAILING CHART" FOR THICKNESS OF PIECES AND THE REQUIRED NAILING.



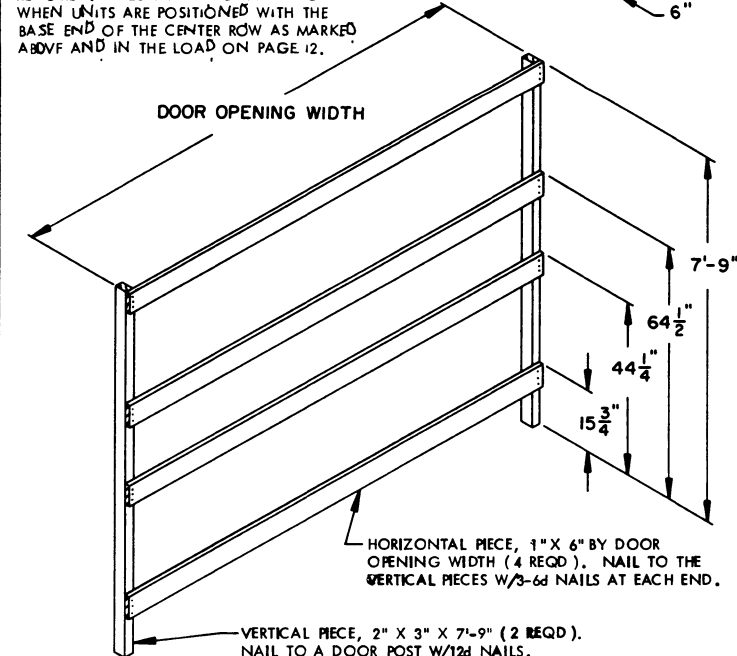
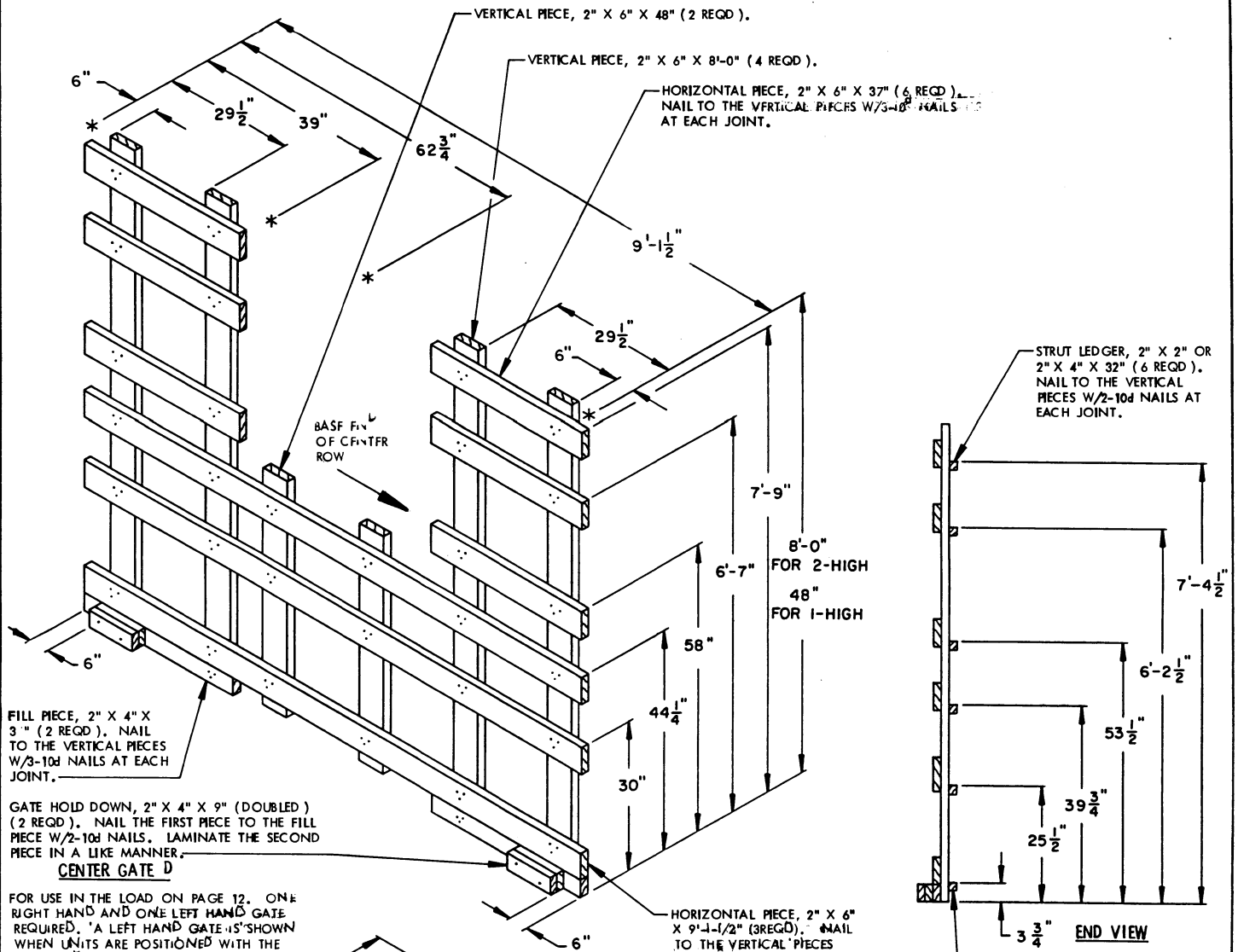
CENTER GATE B

THIS GATE IS DESIGNED FOR USE IN THE LOAD ON PAGE 8.



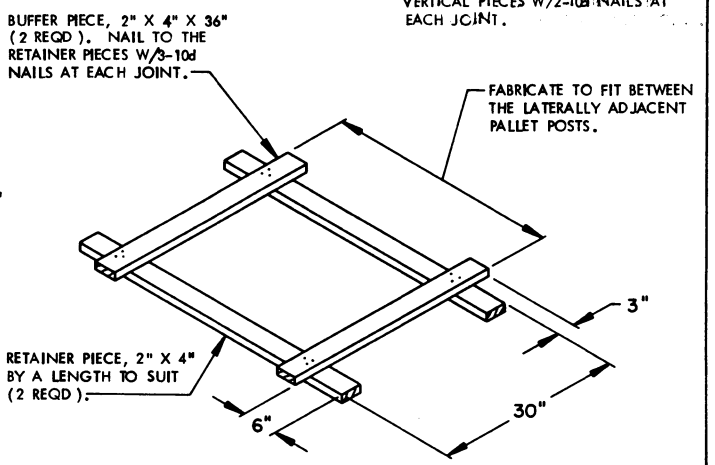
END VIEW

DETAILS



DOORWAY PROTECTION B

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS ON PAGES 8, 10, AND 12.



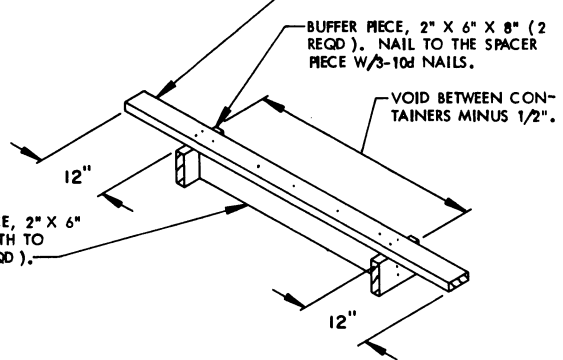
DETAILS

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/5-10d NAILS AND TO THE BUFFER PIECES W/2-10d NAILS AT EACH JOINT.

BUFFER PIECE, 2" X 6" X 8" (2 REQD). NAIL TO THE SPACER PIECE W/3-10d NAILS.

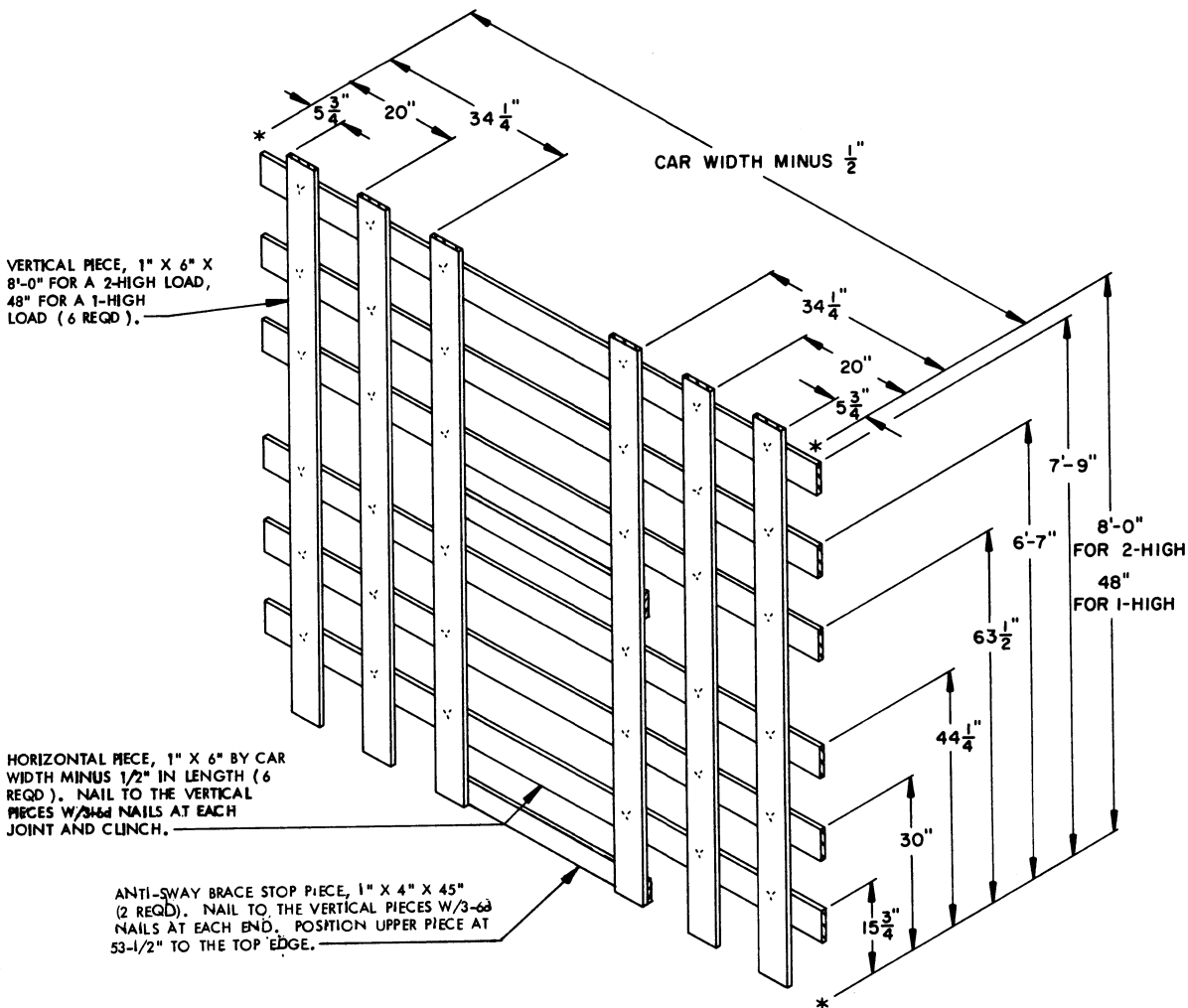
VOID BETWEEN CONTAINERS MINUS 1/2".

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



TOP-OF-LOAD ANTI-SWAY BRACE B

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 10 AND 12.



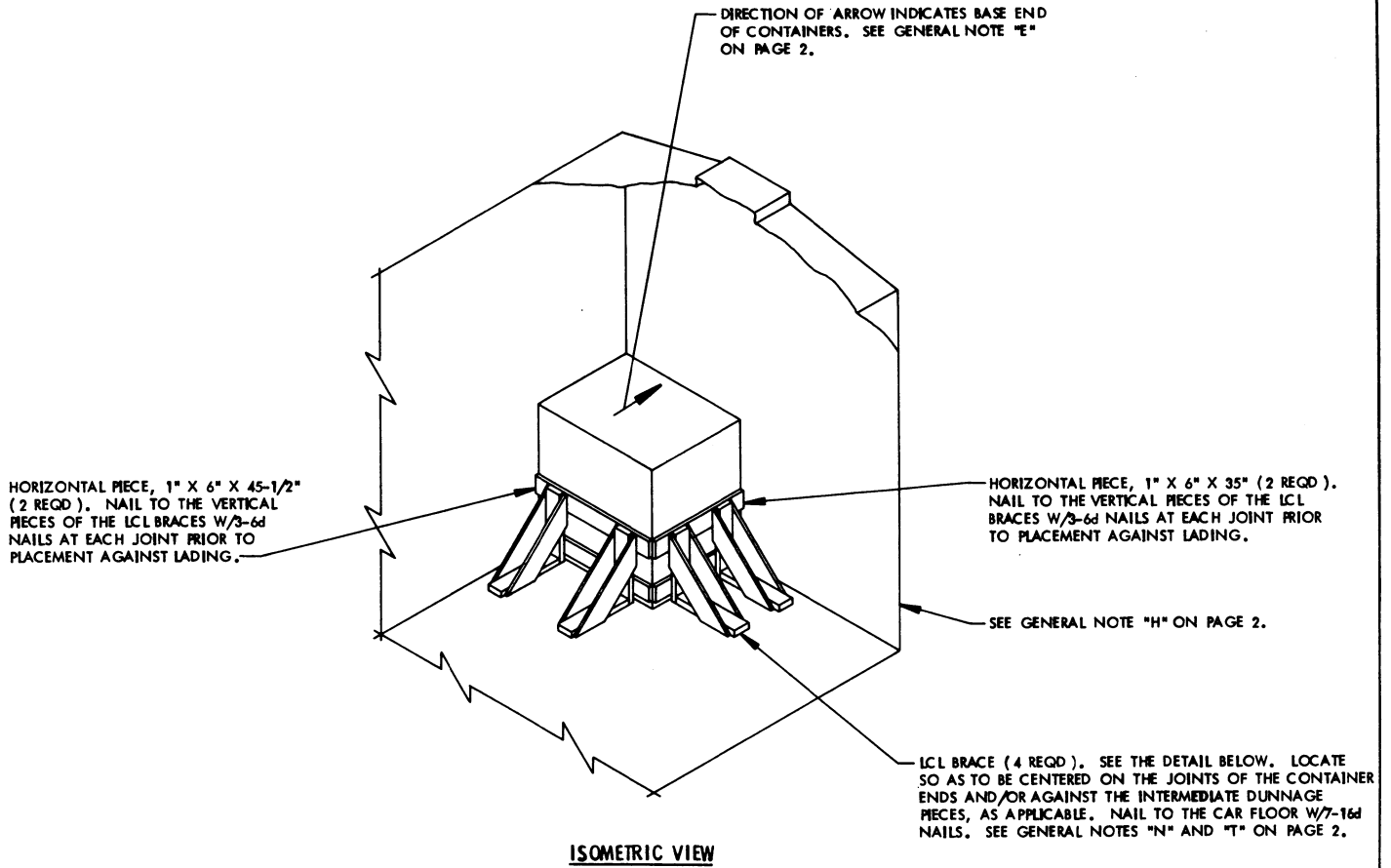
VERTICAL PIECE, 1" X 6" X 8'-0" FOR A 2-HIGH LOAD, 48" FOR A 1-HIGH LOAD (6 REQD).

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

ANTI-SWAY BRACE STOP PIECE, 1" X 4" X 45" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END. POSITION UPPER PIECE AT 53-1/2" TO THE TOP EDGE.

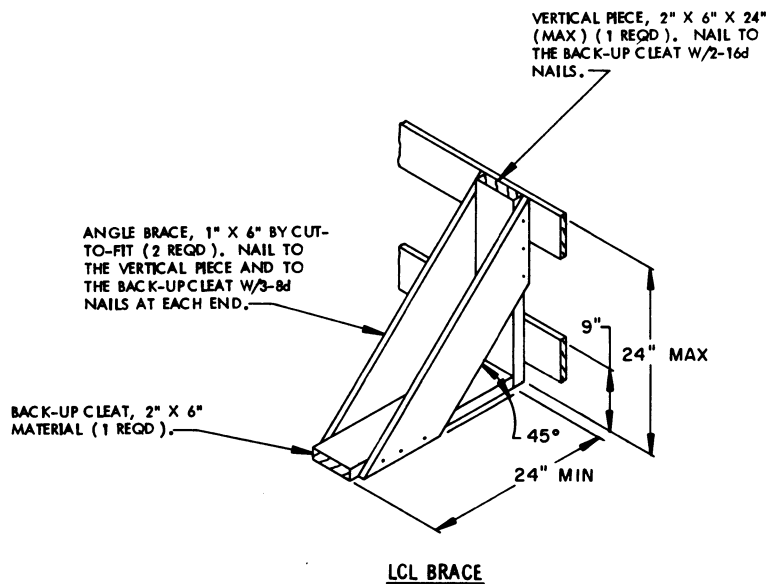
ALTERNATIVE SEPARATOR GATE A

DETAILS

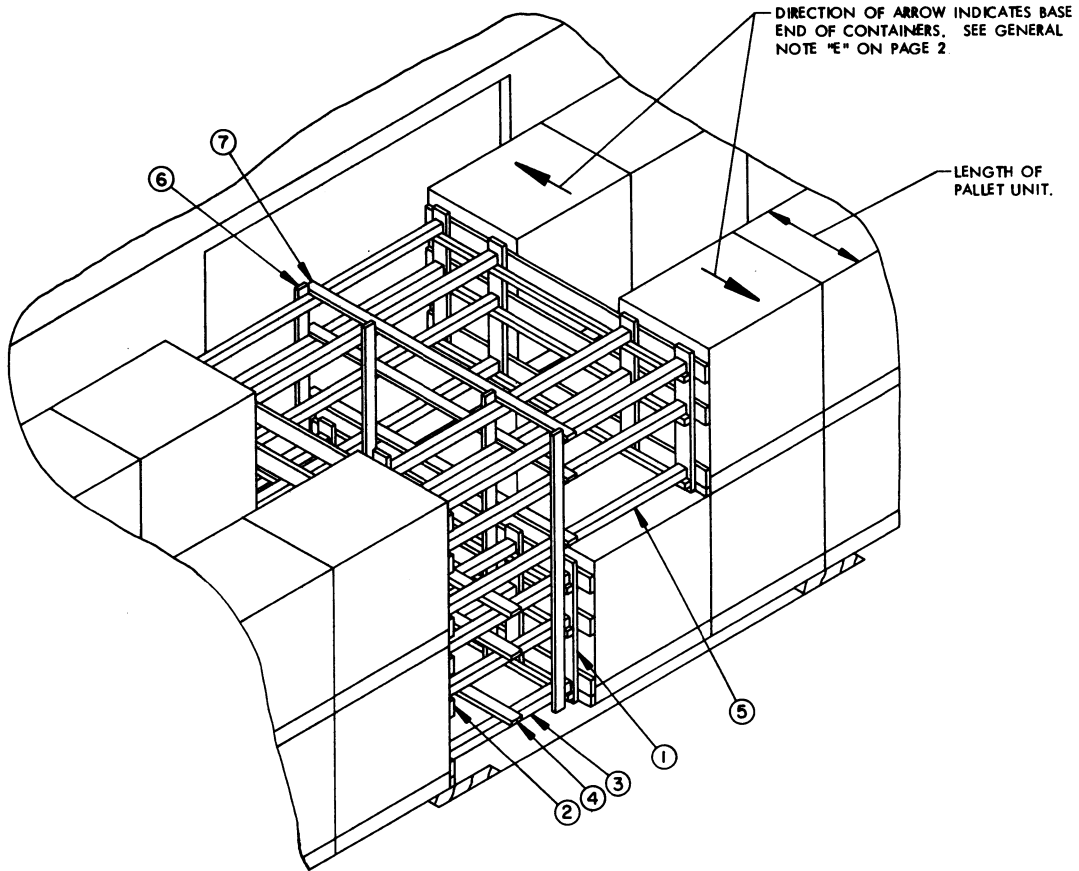


SPECIAL NOTES:

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



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



ISOMETRIC VIEW

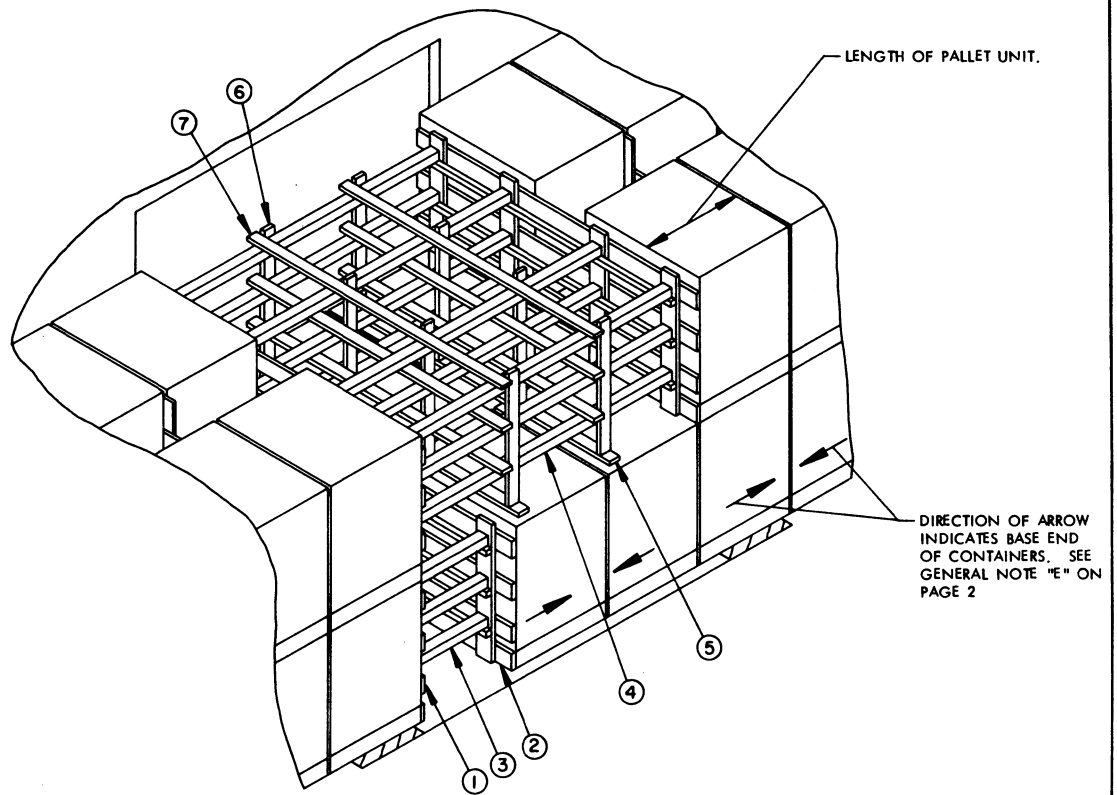
KEY NUMBERS

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
3. THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING IS SHOWN BEING EMPLOYED FOR THE OMISSION OF TWO PALLET UNITS FROM THE 2-WIDE LOAD SHOWN ON PAGE 10. THE METHOD CAN BE ADAPTED FOR USE IN OMITTING PALLET UNITS FROM THE 6-UNIT LOAD UNIT PROCEDURES ON PAGE 12. NOTE THAT CRIB FILL AND CRIB FILL STOP PIECES MUST BE USED IN THE 6-UNIT AND 5-UNIT LOAD UNIT PROCEDURES.

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 5. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② CENTER GATE FOR 2-HIGH (1REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 5.
- 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 "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- ④ HORIZONTAL STRUT BRACING FOR FIRST LAYER UNITS, 2" X 4" BY CAR WIDTH MINUS 4" IN LENGTH (3 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑤ 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.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 7'-11" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 4" IN LENGTH (3 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

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



ISOMETRIC VIEW

KEY NUMBERS

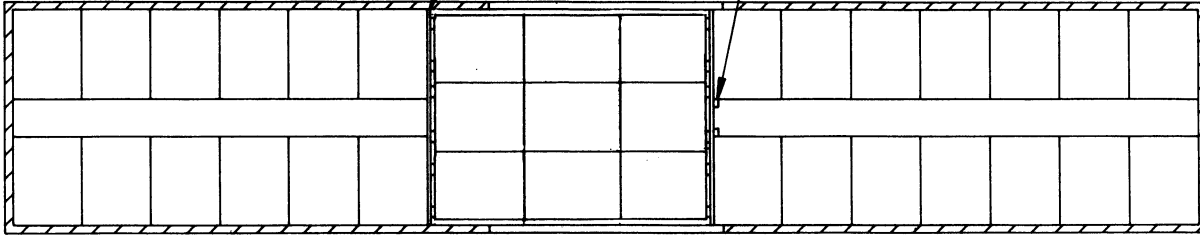
SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. ONLY THE BLOCKING AND BRACING PIECES NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
3. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" MATERIAL, SHOWN AS PIECE MARKED ⑤, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.
4. NOTE THAT IT MAY BE MORE ECONOMICAL TO OMIT ONE LOAD UNIT FROM THE DOORWAY AREA THAN TO OMIT FOUR PALLET UNITS USING THE DEPICTED METHOD.

- ① CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 21.
- ② CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 21.
- 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 "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- 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 STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 46" (8 REQD). NAIL TO THE STRUTS MARKED ④ W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑤, W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 7" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

SEPARATOR GATE (1 OR 2 REQD, AS APPLICABLE). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 29. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE CONTAINERS-CROSSWISE PALLET UNITS.

STOP PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). 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. NOTE THAT 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.



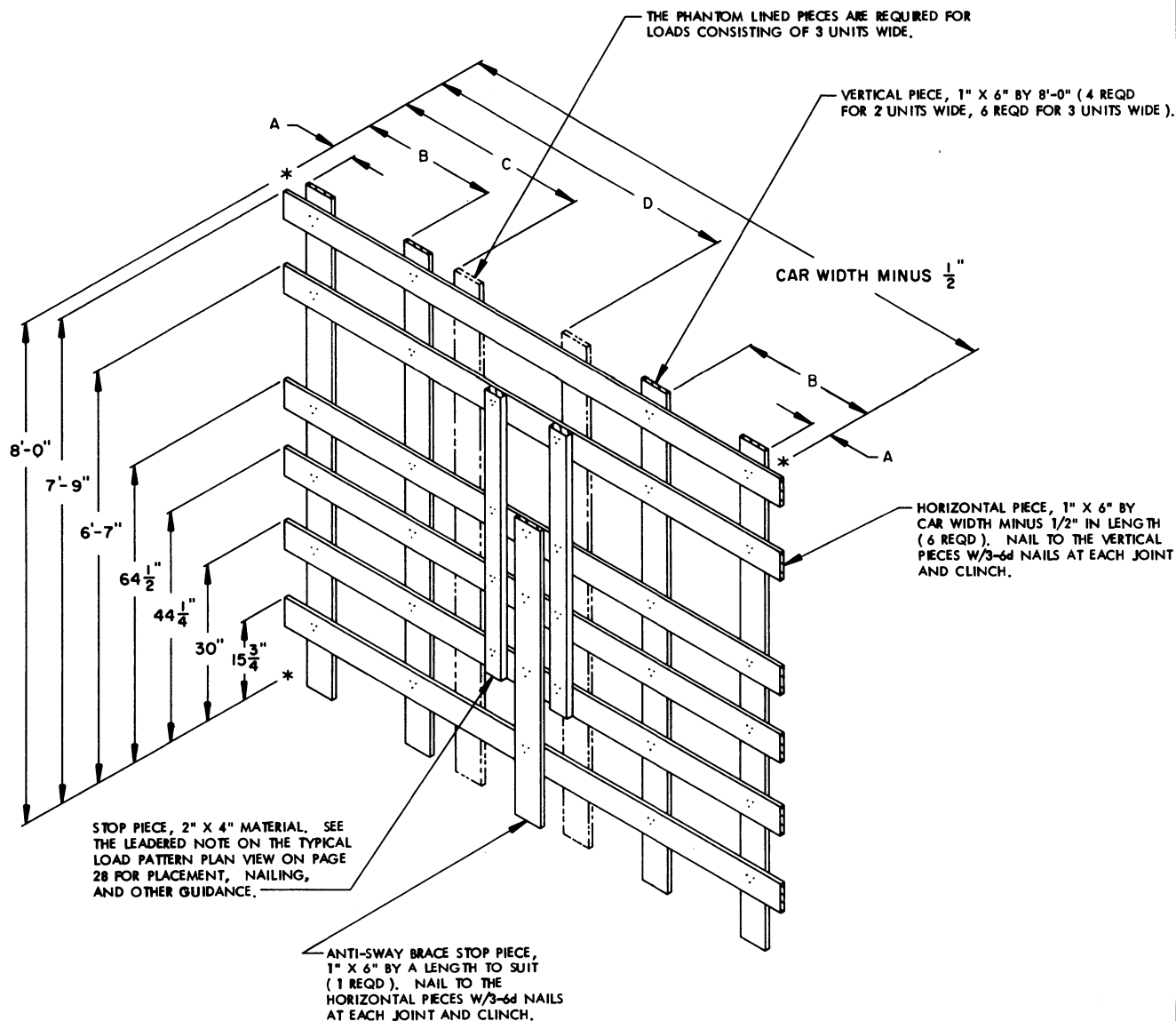
TYPICAL COMBINATION LOAD PATTERN PLAN VIEW

A 13 LONG PLUS 2 WIDE LOAD IS SHOWN

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND OTHER LENGTHS CAN ALSO BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 29 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OF THE OTHER METHODS OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN, INCLUDING THE DEPICTED LCL PROCEDURES.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN SEPARATOR GATE "B" HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "B" 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 CONTAINERS-CROSSWISE UNITS OF THE LOAD.
4. A CHART FOR THE PALLET UNIT IS SHOWN ON THIS PAGE. THE VARIOUS QUANTITIES (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 ATTAIN A LIKE QUANTITY, OR A QUANTITY WITHIN THE RANGE OF THE COMBINATION LOAD METHOD, AS WELL AS THE APPROXIMATE LENGTHS OF THE STRUTS, ARE ALSO INCLUDED IN THE CHARTS.
5. A COMBINATION LOAD MAY CONSIST OF TWO OR THREE PALLET UNITS POSITIONED ACROSS THE WIDTH OF THE CAR. THE UNITS PER LAYER COLUMN REFLECTS BOTH TWO AND THREE-UNIT WIDE LOADS.

CAR LENGTH	UNITS PER LAYER		LOAD PATTERN	APPROX STRUT LENGTH
	2-UNITS ACROSS CAR	3-UNITS ACROSS CAR		
40'-6" CAR	24		CONTAINERS-LENGTHWISE LOAD ON PAGE 6	53"
	24	26	10 LONG AT 35-1/4" PLUS 2 WIDE AT 45-3/4"	30"
	22	25	8 LONG AT 35-1/4" PLUS 3 WIDE AT 45-3/4"	55"
	22	26	7 LONG AT 35-1/4" PLUS 4 WIDE AT 45-3/4"	45"
	22	27	6 LONG AT 35-1/4" PLUS 5 WIDE AT 45-3/4"	35"
	22	28	5 LONG AT 35-1/4" PLUS 6 WIDE AT 45-3/4"	25"
	20	27	3 LONG AT 35-1/4" PLUS 7 WIDE AT 45-3/4"	50"
	20	28	2 LONG AT 35-1/4" PLUS 8 WIDE AT 45-3/4"	40"
	20	30	CONTAINERS-CROSSWISE LOAD ON PAGE 8	22"
50'-6" CAR	32		CONTAINERS-LENGTHWISE LOAD ON PAGE 6	31"
	30	32	12 LONG AT 35-1/4" PLUS 3 WIDE AT 45-3/4"	33"
	28	32	10 LONG AT 35-1/4" PLUS 4 WIDE AT 45-3/4"	58"
	28	33	9 LONG AT 35-1/4" PLUS 5 WIDE AT 45-3/4"	48"
	28	34	8 LONG AT 35-1/4" PLUS 6 WIDE AT 45-3/4"	38"
	28	35	7 LONG AT 35-1/4" PLUS 7 WIDE AT 45-3/4"	28"
	26	34	5 LONG AT 35-1/4" PLUS 8 WIDE AT 45-3/4"	53"
	26	35	4 LONG AT 35-1/4" PLUS 9 WIDE AT 45-3/4"	43"
	26	36	3 LONG AT 35-1/4" PLUS 10 WIDE AT 45-3/4"	33"
24	36	CONTAINERS-CROSSWISE LOAD ON PAGE 8	51"	
60'-8" CAR	38		CONTAINERS-LENGTHWISE LOAD ON PAGE 6	45"
	36	39	15 LONG AT 35-1/4" PLUS 3 WIDE AT 45-3/4"	48"
	36	40	14 LONG AT 35-1/4" PLUS 4 WIDE AT 45-3/4"	38"
	36	41	13 LONG AT 35-1/4" PLUS 5 WIDE AT 45-3/4"	27"
	34	41	10 LONG AT 35-1/4" PLUS 7 WIDE AT 45-3/4"	43"
	34	42	9 LONG AT 35-1/4" PLUS 8 WIDE AT 45-3/4"	33"
	34	43	8 LONG AT 35-1/4" PLUS 9 WIDE AT 45-3/4"	23"
	32	42	6 LONG AT 35-1/4" PLUS 10 WIDE AT 45-3/4"	48"
	32	43	5 LONG AT 35-1/4" PLUS 11 WIDE AT 45-3/4"	38"
	32	44	4 LONG AT 35-1/4" PLUS 12 WIDE AT 45-3/4"	28"
30	45	CONTAINERS-CROSSWISE LOAD ON PAGE 8	35"	

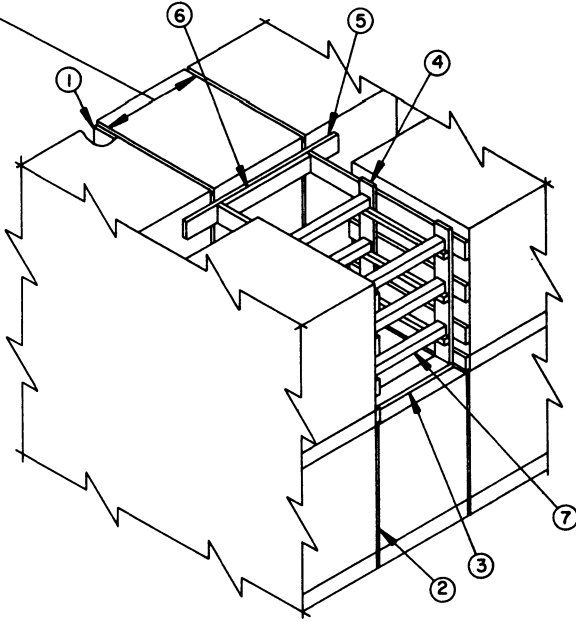


SEPARATOR GATE B

VERTICAL PIECE PLACEMENT						
CAR WIDTH	2-WIDE		3-WIDE			
	A	B	A	B	C	D
9'-6"	4"	27-1/2"	8"	31-1/2"	41"	64-3/4"
9'-4"	4"	27-1/2"	7"	30-1/2"	39"	63-3/4"
9'-2"	4"	27-1/2"	6"	29-1/2"	38"	62-3/4"
LESS THAN 9'-2" (8'-11" MIN)	4"	27-1/2"	4"	27-1/2"	37"	60-3/4"

THIS VIEW DEPICTS A SEPARATOR GATE FOR USE IN THE COMBINATION LOAD SHOWN IN THE PLAN VIEW ON PAGE 28 OR AS DESCRIBED IN THE LOAD PLAN CHARTS. THE LOCATION OF THE VERTICAL PIECES ON THE SEPARATOR GATE ARE APPLICABLE FOR USE WHEN THE CONTAINERS CROSSWISE UNITS IN THE CENTER PORTION OF THE LOAD ARE TWO UNITS WIDE, THOSE UNITS MUST BE CENTERED IN THE WIDTH OF THE CAR. SEE THE "VERTICAL PIECE PLACEMENT" CHART AT LEFT FOR CONSTRUCTION GUIDANCE.

← LENGTH OF PALLET UNIT.



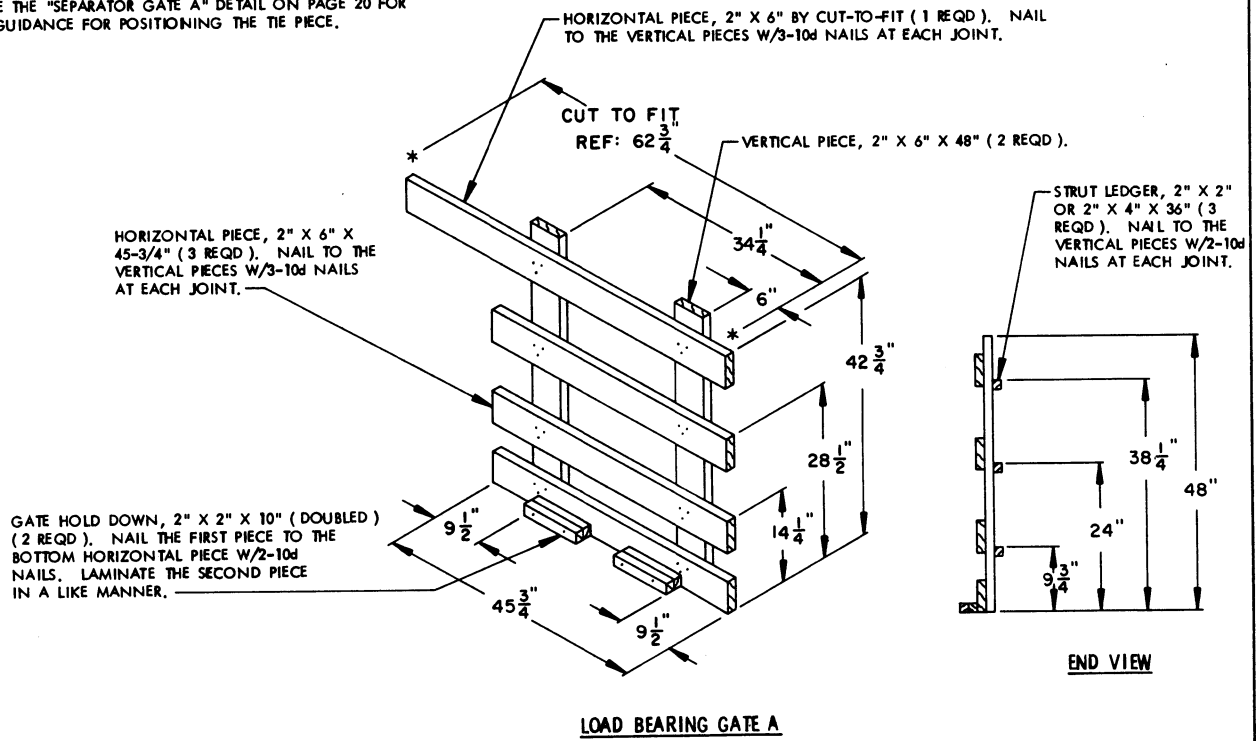
ISOMETRIC VIEW

KEY NUMBERS

- ① SEPARATOR GATE (2 REQD). PLYWOOD, 3/8" THICK X 45-1/2" WIDE X 8'-0" HIGH. SEE SPECIAL NOTE 5 ON THIS PAGE FOR GATE MODIFICATIONS.
- ② SEPARATOR GATE (2 REQD). PLYWOOD, 3/8" THICK X 45-1/2" WIDE X 48" HIGH. SEE SPECIAL NOTE 5 ON THIS PAGE FOR GATE MODIFICATIONS.
- ③ SUPPORT PIECE, 2" X 6" X 36" (2 REQD). POSITION SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ④.
- ④ 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 ⑥, W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ③, W/2-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ⑤ ANTI-SWAY BEARING PIECE, 2" X 6" X 60" (1 REQD).
- ⑥ FILLER PIECE, 2" X 6" X 33" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ⑤, W/5-10d NAILS.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 30") (6 REQD). TOENAIL TO PIECES MARKED ④ W/2-10d NAILS AT EACH END.

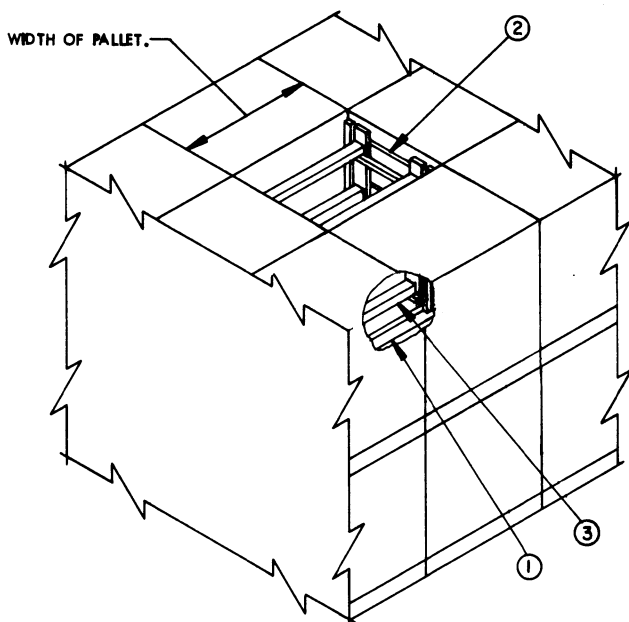
SPECIAL NOTES:

- 1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
- 2. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL.
- 3. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
- 4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
- 5. PLYWOOD SEPARATOR GATES MUST BE USED. THE 2-HIGH PLYWOOD GATE, PIECE MARKED ①, MUST BE TIED TO THE 1-HIGH PLYWOOD GATE, PIECE MARKED ②. ONE (1) TIE PIECE WILL BE REQUIRED FOR GATES OPPOSITE EACH OTHER. SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20 FOR LOCATION AND GUIDANCE FOR POSITIONING THE TIE PIECE.



LOAD BEARING GATE A

END VIEW



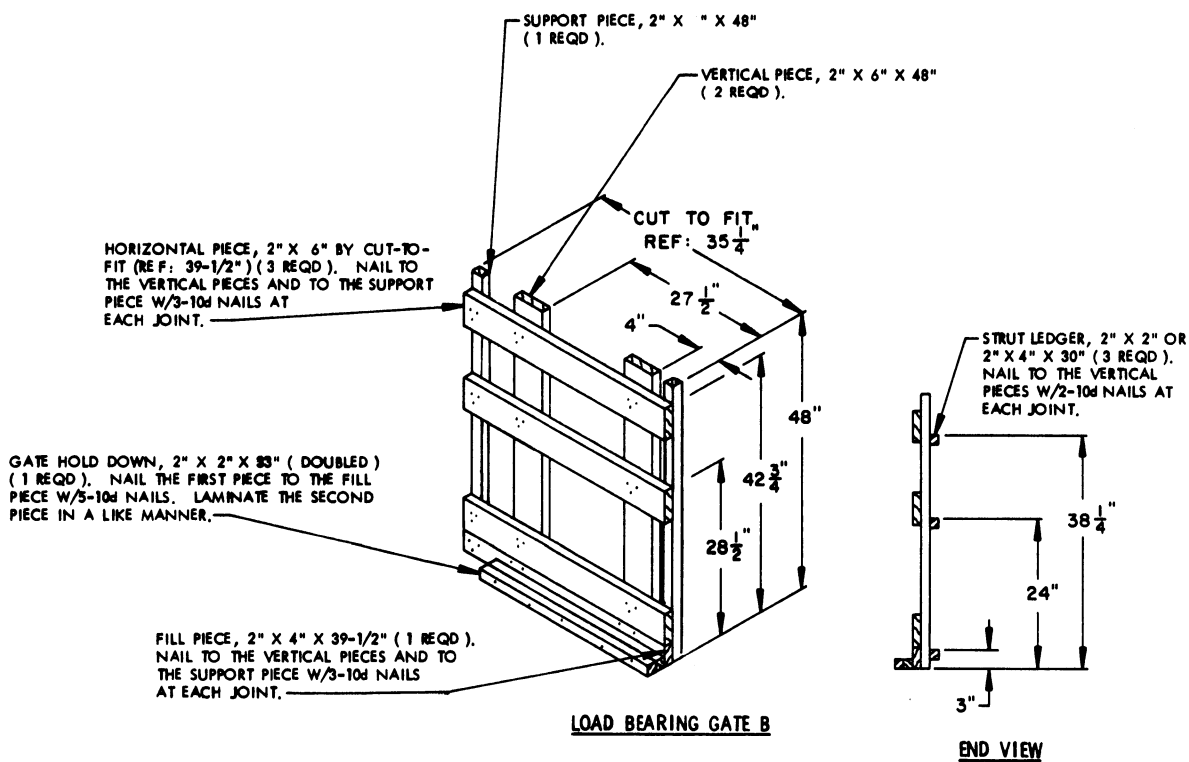
ISOMETRIC VIEW

KEY NUMBERS

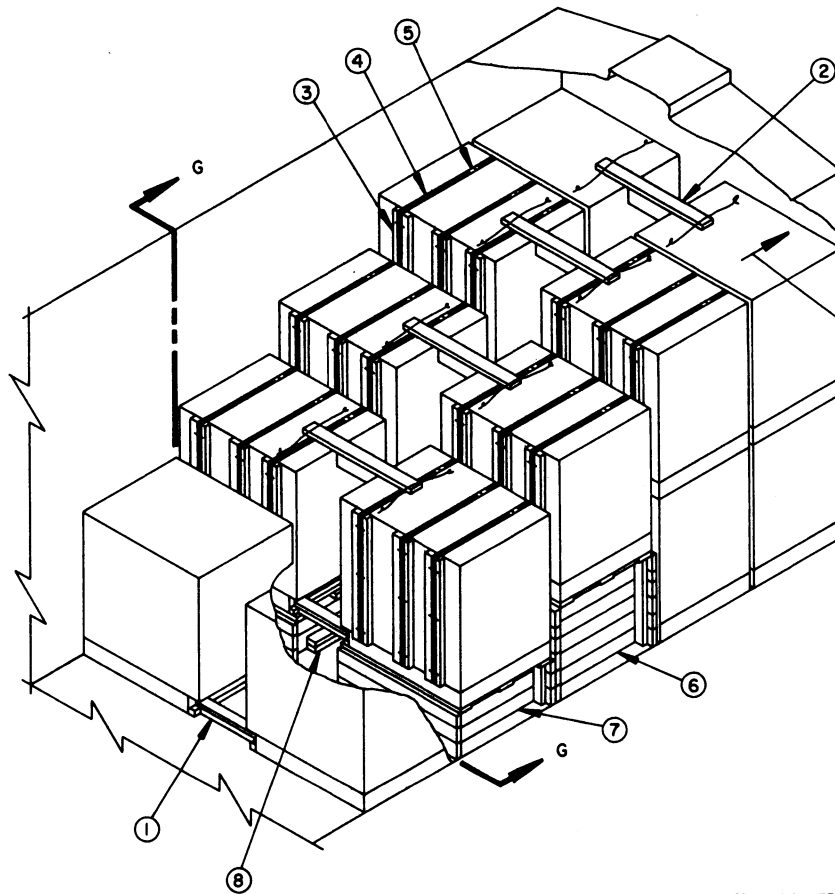
- ① SUPPORT PIECE, 2" X 6" X 45-3/4" (2 REQD). POSITION SO AS TO BE BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "LOAD BEARING GATE B" DETAIL BELOW. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ①, W/2-10d NAILS AT EACH JOINT. **CAUTION:** USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ③ STRUT, 4" X 4" X 39-3/4" (6 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.

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.
- 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 THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



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



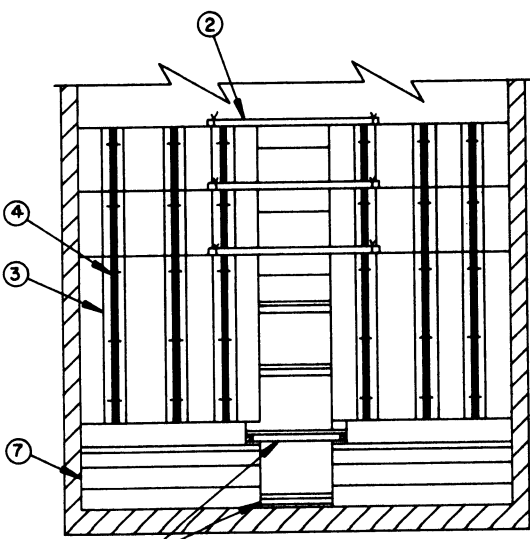
THE DIRECTION OF THE ARROW INDICATES BASE END OF CONTAINERS. SEE GENERAL NOTE "E" ON PAGE 2.

SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW

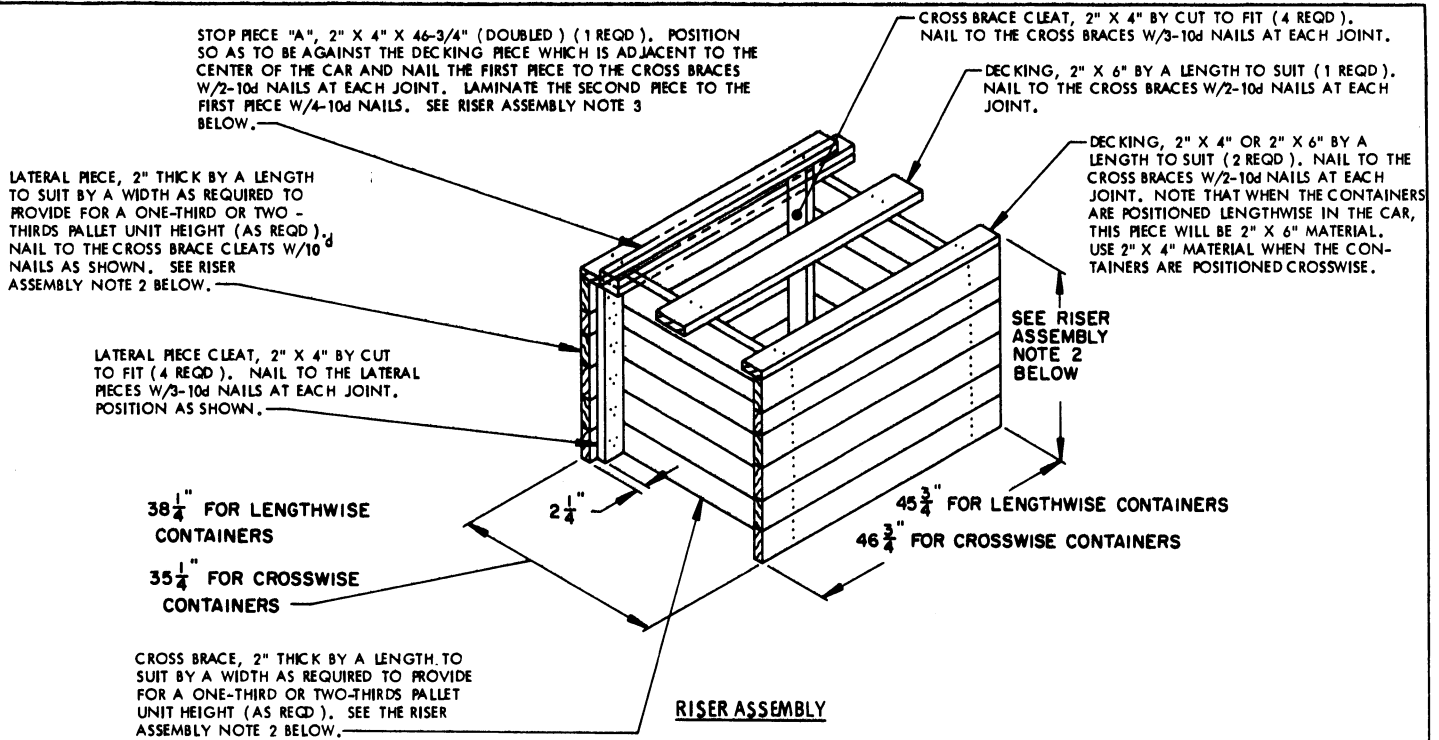
KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 33.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 51.
- ③ STRAPPING BOARD, 2" X 6" X 42-3/4" (48 REQD/6 PER PALLET UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 34. SEE SPECIAL NOTE 5 ON PAGE 33.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 15'-0" LONG (REF) STEEL STRAPPING (24 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO A STRAPPING BOARD W/3 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 34.
- ⑤ SEAL FOR 1-1/4" STRAPPING (48 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑥ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 33.
- ⑦ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE ONE-THIRD OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 33.
- ⑧ STOP PIECE "B", 2" X 4" X 24" (DOUBLED) (4 REQD). POSITION AS SHOWN AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST W/4-10d NAILS.



SECTION G-G

TYLICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING

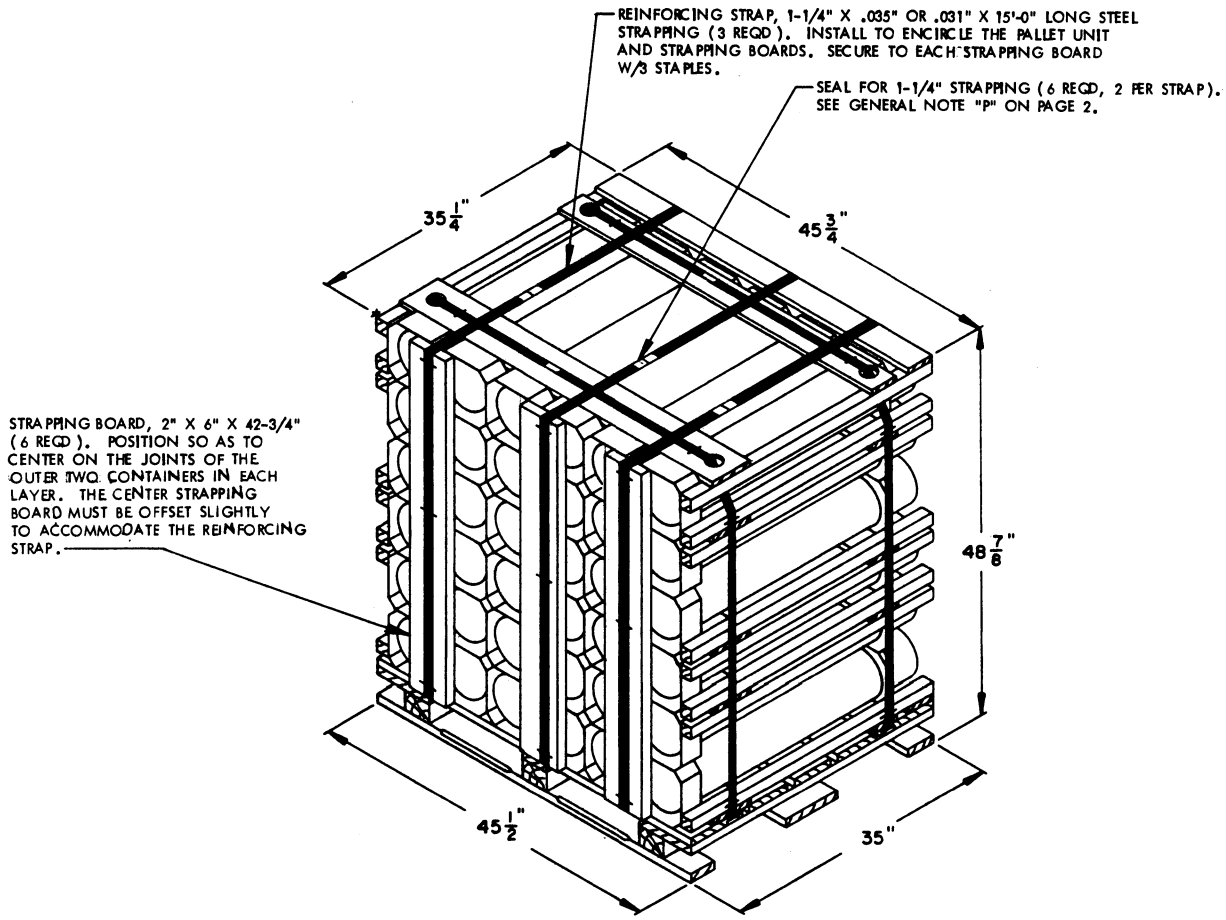


SPECIAL NOTES FOR LOAD:

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 TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED SO THE CONTAINERS ARE LENGTHWISE IN THE CAR. WITH MODIFICATIONS, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE POSITIONED CONTAINERS. SEE SPECIAL NOTES 4 AND 5.
3. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
4. ANTI-SWAY BRACE "A" IS APPLICABLE FOR ALL THE LENGTHWISE POSITIONED CONTAINERS. ANTI-SWAY BRACE "B" AS DETAILED ON PAGE 23 WILL BE USED FOR CROSSWISE POSITIONED CONTAINERS.
5. PALLET UNITS OF CROSSWISE POSITIONED CONTAINERS MAY BE LOADED 3-WIDE ACROSS THE CAR. IF THE LATERAL VOID IS THREE INCHES (3") OR MORE, CRIB FILL MUST BE INSTALLED.
6. TOP-OF-LOAD ANTI-SWAY BRACE "A" IS APPLICABLE FOR LENGTHWISE POSITIONED CONTAINERS. TOP-OF-LOAD ANTI-SWAY BRACE "B", AS DETAILED ON PAGE 24, WILL BE USED FOR CROSSWISE POSITIONED CONTAINERS.
7. FOR CROSSWISE POSITIONED CONTAINERS, THE STRAPPING BOARDS SHOWN AS PIECES MARKED (3) WILL NOT BE REQUIRED. SEE THE METHOD "B" DETAIL ON PAGE 35 FOR MODIFICATIONS TO BE ACCOMPLISHED IN LIEU OF USING STRAPPING BOARDS, WHEN THE CONTAINERS ARE TO BE POSITIONED CROSSWISE IN THE CAR. ALSO, FOR LOADS OF CROSSWISE CONTAINERS, STOP PIECE "A", AS SHOWN ON THE RISER DETAIL ABOVE, WILL BE USED IN LIEU OF STOP PIECE "B", PIECE MARKED (8) ON THE LOAD ON PAGE 30.

SPECIAL NOTES FOR RISER ASSEMBLY:

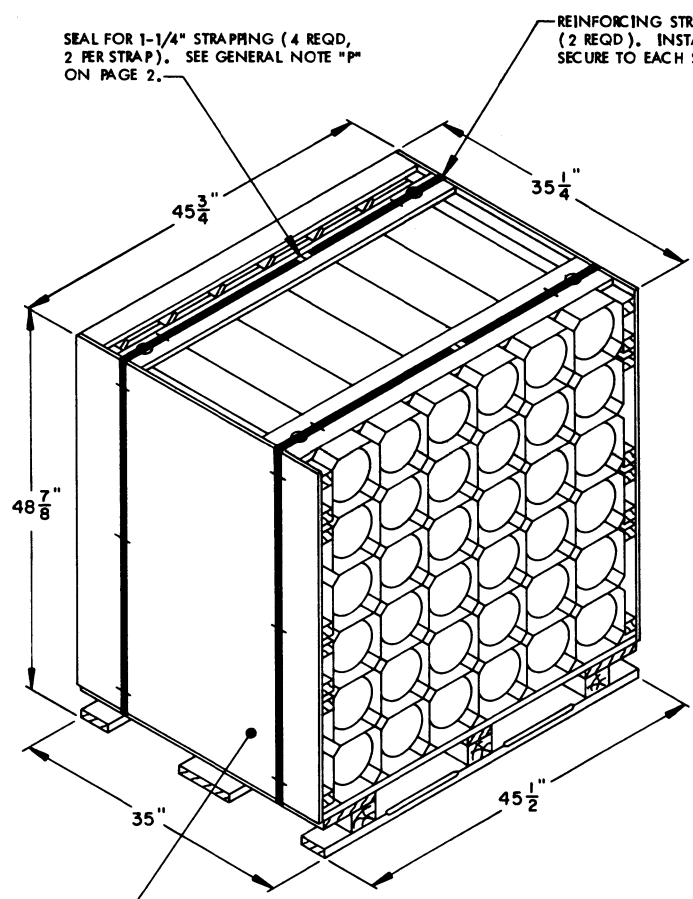
1. A TYPICAL RISER ASSEMBLY IS SHOWN ABOVE. THE HEIGHT OF THE UNIT IS 48-7/8". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER (6) IN THE LOAD ON PAGE 32. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FIVE (5) PIECES OF 2" X 6" MATERIAL AND ONE (1) PIECE OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 32-1/2" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER (7) IN THE LOAD ON PAGE 32, WILL BE FABRICATED FROM TWO (2) PIECES OF 2" X 6" AND ONE (1) PIECE OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 16" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL/CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. NOTE: A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT.
3. THE STOP PIECE "A" SHOWN ON THE RISER ASSEMBLY ABOVE IS ONLY FOR USE WHEN THE PALLET UNITS ARE WITH THE CONTAINERS CROSSWISE IN THE CAR. IF THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR, AS SHOWN ON PAGE 32, POSITION A DOUBLED 2" X 4" BY A LENGTH TO SUIT (REF: 24") ON THE FLOOR AGAINST THE CROSS BRACE AND NAIL TO THE CAR FLOOR W/4-16d NAILS. SEE KEY NUMBER (8) ON PAGE 32.



METHOD A

NOTE:

THE "METHOD A" DETAIL ABOVE SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WHICH ARE TO BE POSITIONED WITH CONTAINERS-LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL LAYER BRACING SHOWN ON PAGE 32. FOR MODIFICATION OF UNITS TO BE POSITIONED CONTAINERS CROSSWISE IN A CAR, REFER TO "METHOD B" DETAIL ON PAGE 35.



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

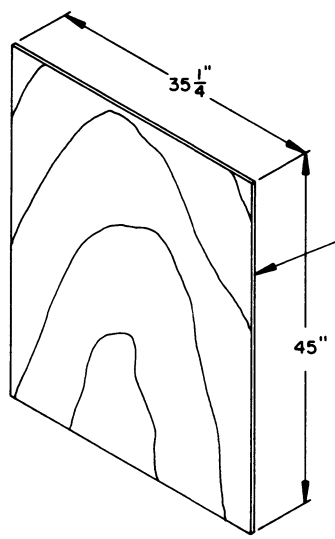
REINFORCING STRAP, 1-1/4" X .035" OR .031" X 16'-6" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE SIDE FILL ASSEMBLIES. SECURE TO EACH SIDE FILL ASSEMBLY WITH STAPLES.

SIDE FILL ASSEMBLY (2 REQD). SEE THE DETAIL BELOW.

METHOD B

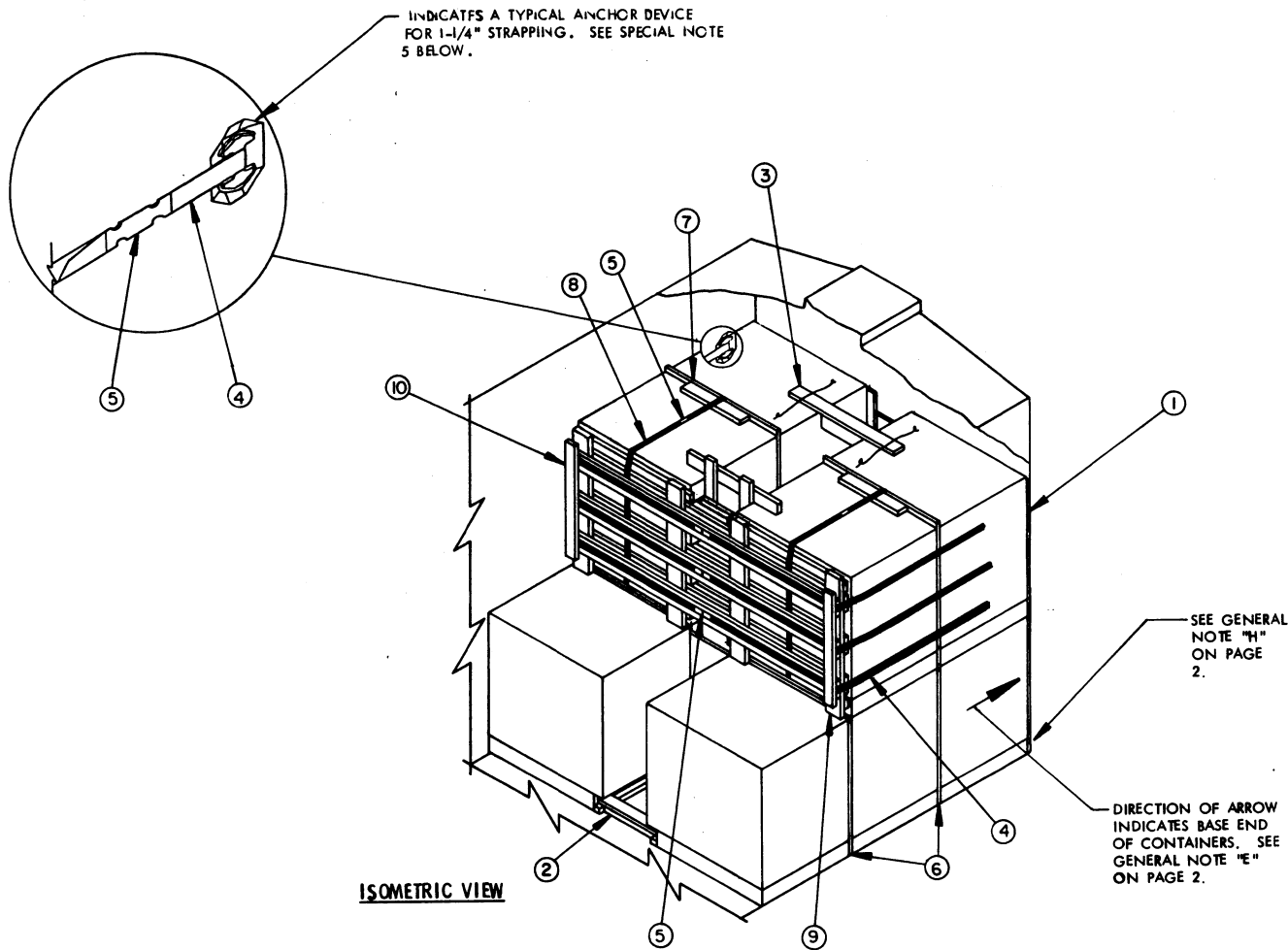
NOTE:

THE "METHOD B" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WITH CONTAINERS POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL LAYER BRACING SHOWN ON PAGE 32. FOR PALLET UNITS WITH CONTAINERS POSITIONED LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL ON PAGE 34.



PLYWOOD, 1/2" X 35-1/4" X 45" HIGH (2 REQD).

SIDE FILL ASSEMBLY



INDICATES A TYPICAL ANCHOR DEVICE FOR 1-1/4" STRAPPING. SEE SPECIAL NOTE 5 BELOW.

SEE GENERAL NOTE "H" ON PAGE 2.

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

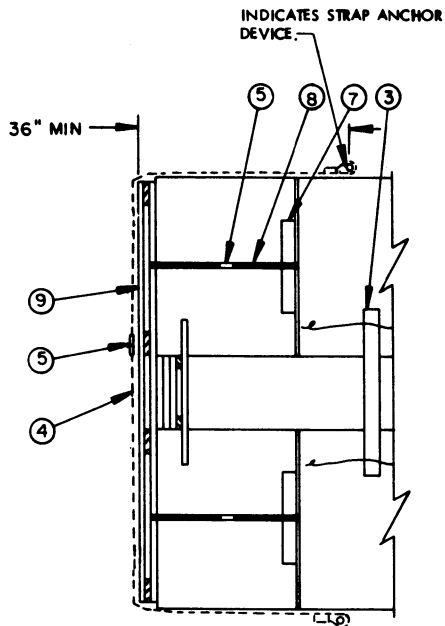
ISOMETRIC VIEW

KEY NUMBERS

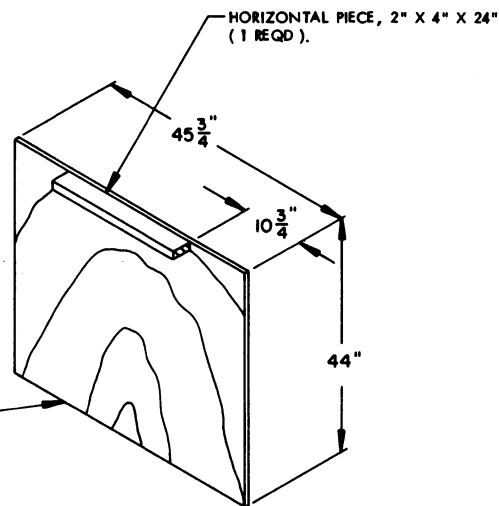
SPECIAL NOTES:

1. A 9'-4" WIDE ALL METAL BOX CAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BULKHEAD GATE METHOD OF PARTIAL LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED CONTAINERS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED CONTAINERS 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 18,000 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 12,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS.
4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE J-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 27 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 30 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 37 FOR THE LOCATION OF THE HORIZONTAL PIECES IN RELATION TO THE LOCATION OF THE STRAPPING BOARDS. THE STRAPPING BOARDS/HORIZONTAL PIECES 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.

- ① END WALL LINING (1 REQD). SEE THE DETAIL ON PAGE 50. SEE GENERAL NOTE "D" ON PAGE 2. NOTE THAT IF AN END OF CAR BULKHEAD, AS DETAILED ON PAGE 51 IS USED, THE END WALL LINING IS NOT REQUIRED.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN THE Laterally ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51.
- ④ BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM TWO EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 37 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 AND 4 AT LEFT.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ④, AND 1 PER BUNDLING STRAP, PIECE MARKED ⑧).
- ⑥ SEPARATOR GATE FOR I-HIGH LOAD (2 REQD). SEE THE "SEPARATOR GATE A" ON PAGE 20.
- ⑦ STRAPPING BOARD ASSEMBLY (2 REQD). SEE THE "STRAPPING BOARD ASSEMBLY B" DETAIL ON PAGE 37.
- ⑧ BUNDLING STRAP, 1-1/4" X .035" X 15'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED ⑦. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ④.
- ⑨ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 37. SEE SPECIAL NOTE 2 AT LEFT.
- ⑩ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-42d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.



STRAP APPLICATION PLAN VIEW



STRAPPING BOARD ASSEMBLY B

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

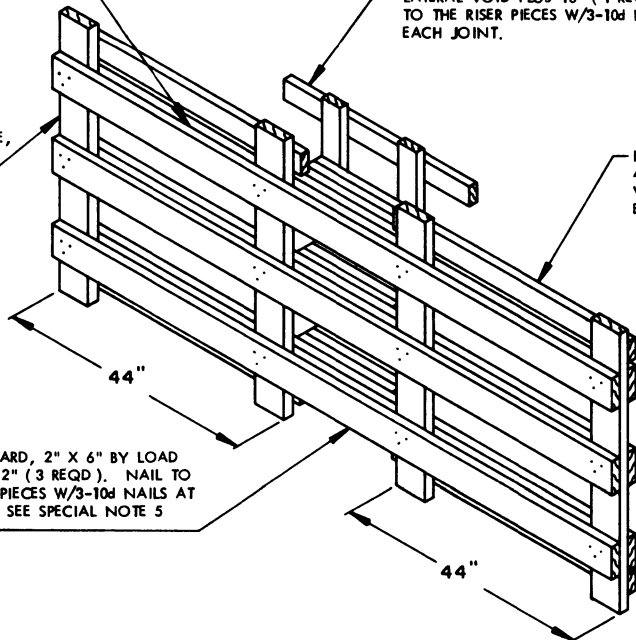
SUPPORT PIECE, 2" X 4" BY WIDTH OF LATERAL VOID PLUS 18" (1 REQD). NAIL TO THE RISER PIECES W/3-10d NAILS AT EACH JOINT.

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

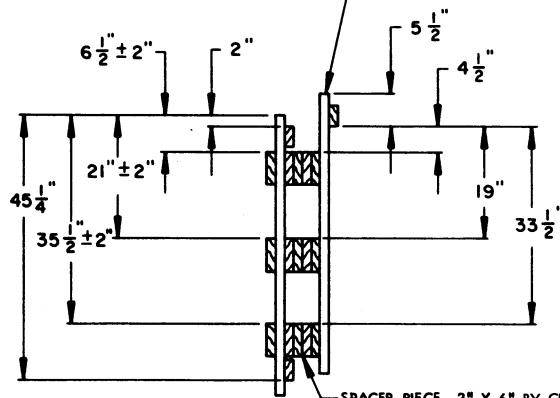
HORIZONTAL PIECE, 2" X 4" X 45-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

RISER PIECE, 2" X 4" X 48" (2 REQD). NAIL TO THE SPACER PIECES W/3-10d NAILS AT EACH JOINT.

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 36.

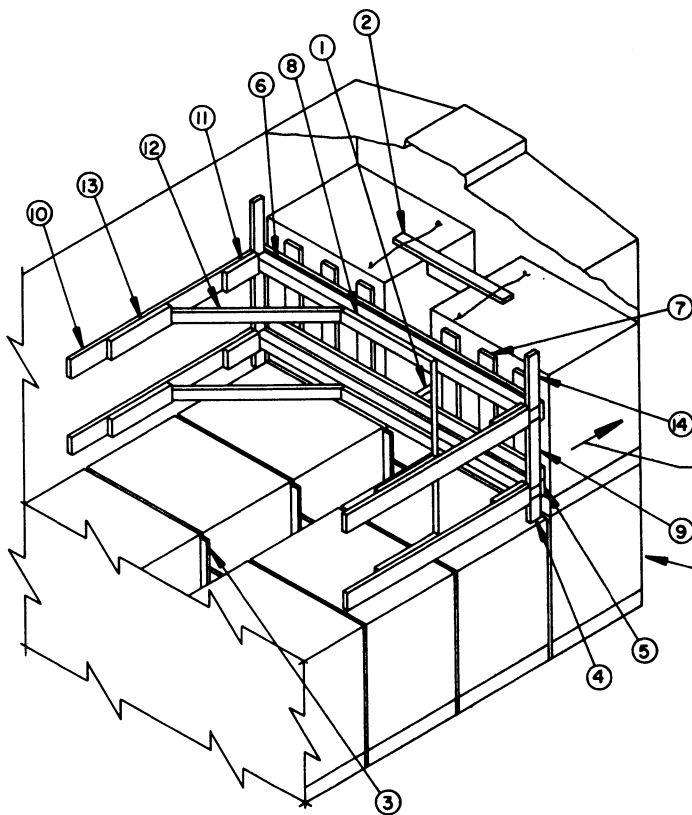


BULKHEAD GATE



END VIEW

SPACER PIECE, 2" X 6" BY CUT TO FIT (TRIPLED) (3 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/5-10d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.



ISOMETRIC VIEW

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

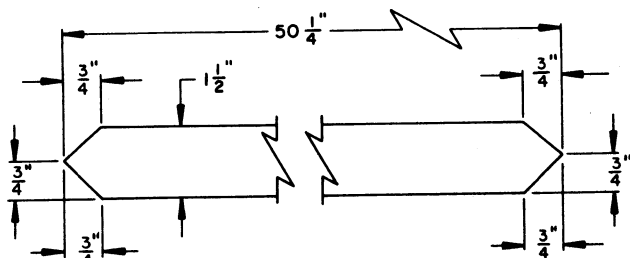
IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 51.

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. A LENGTHWISE LOAD USING PARTIAL-LAYER BRACING IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CROSSWISE LOADS.
3. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CAR FOR SECUREMENT OF A PARTIAL TOP TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 39, 40, AND 41 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
4. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ④, ⑤, ⑥, ⑨, ⑪, AND ⑭ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑫ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑩ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF. 60°) TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑩ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑩ IS DOUBLED.
5. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑧, 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.

KEY NUMBERS

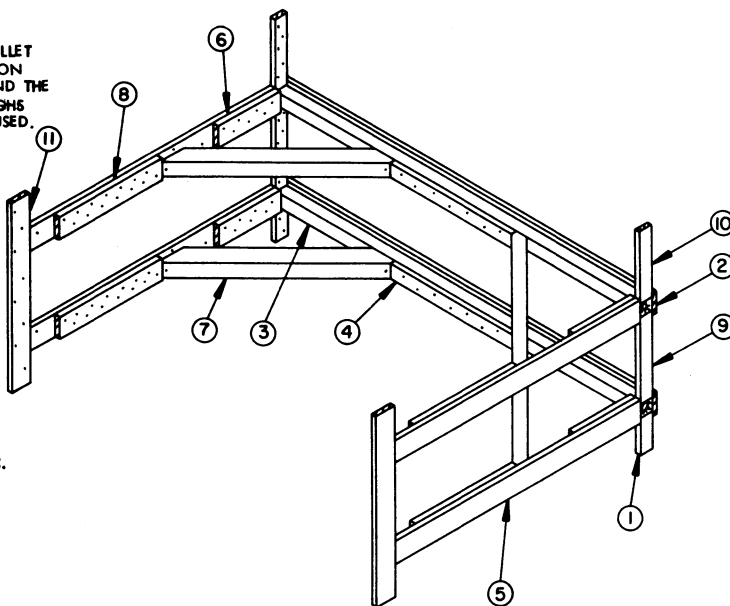
- ① ANTI-SWAY BRACE (1 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT. WIRE TIE TO PALLET POST TO PREVENT DISPLACEMENT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SEPARATOR GATE (2 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20 AND/OR THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24.
- ④ SUPPORT CLEAT, 2" X 4" X 10-1/4" (2 REQD). POSITION 1" ABOVE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. FOR CONTAINERS CROSSWISE LOADS, USE 2" X 4" X 12" POSITIONED HORIZONTALLY 4" ABOVE THE LOWER PALLET UNIT. SEE SPECIAL NOTE 4 AT LEFT.
- ⑤ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS BRACE, PIECE MARKED ⑥, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).
- ⑦ LOAD BEARING GATE (1 REQD). SEE THE "LOAD BEARING GATE C" DETAIL ON PAGE 39. NOT REQUIRED FOR CONTAINERS CROSSWISE LOADS.
- ⑧ 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 5 ON THIS PAGE.
- ⑨ SPACER CLEAT, 2" X 4" X 25" FOR CONTAINERS LENGTHWISE LOADS, 2" X 4" X 31" FOR CONTAINERS CROSSWISE (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑪ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/4-16d NAILS.
- ⑫ 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 ⑩, W/2-16d NAILS AT EACH END.
- ⑬ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/8-16d NAILS.
- ⑭ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



DIAGONAL BRACE

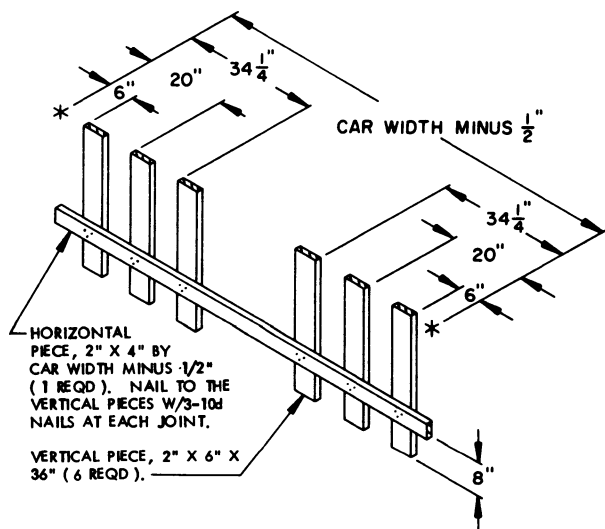
SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN NINE (9) PALLET UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 40 AND 41 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 38 MAY BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, 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 38 FOR A TYPICAL INSTALLATION OF A K-BRACE.



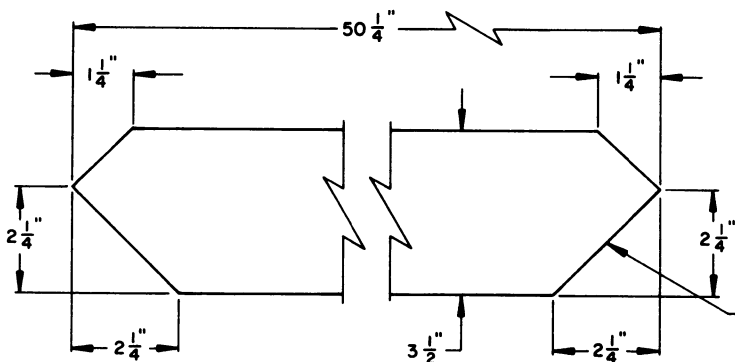
KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10-1/4" (2 REQD). FOR LENGTHWISE POSITIONED CONTAINERS, POSITION 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. FOR CONTAINERS CROSSWISE LOADS, USE 2" X 4" X 12" POSITIONED HORIZONTALLY 4" ABOVE THE LOWER PALLET UNIT. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" 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 25" FOR CONTAINERS LENGTHWISE LOADS, 2" X 4" X 31" FOR CONTAINERS CROSSWISE LOADS (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" X 48" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



LOAD BEARING GATE C

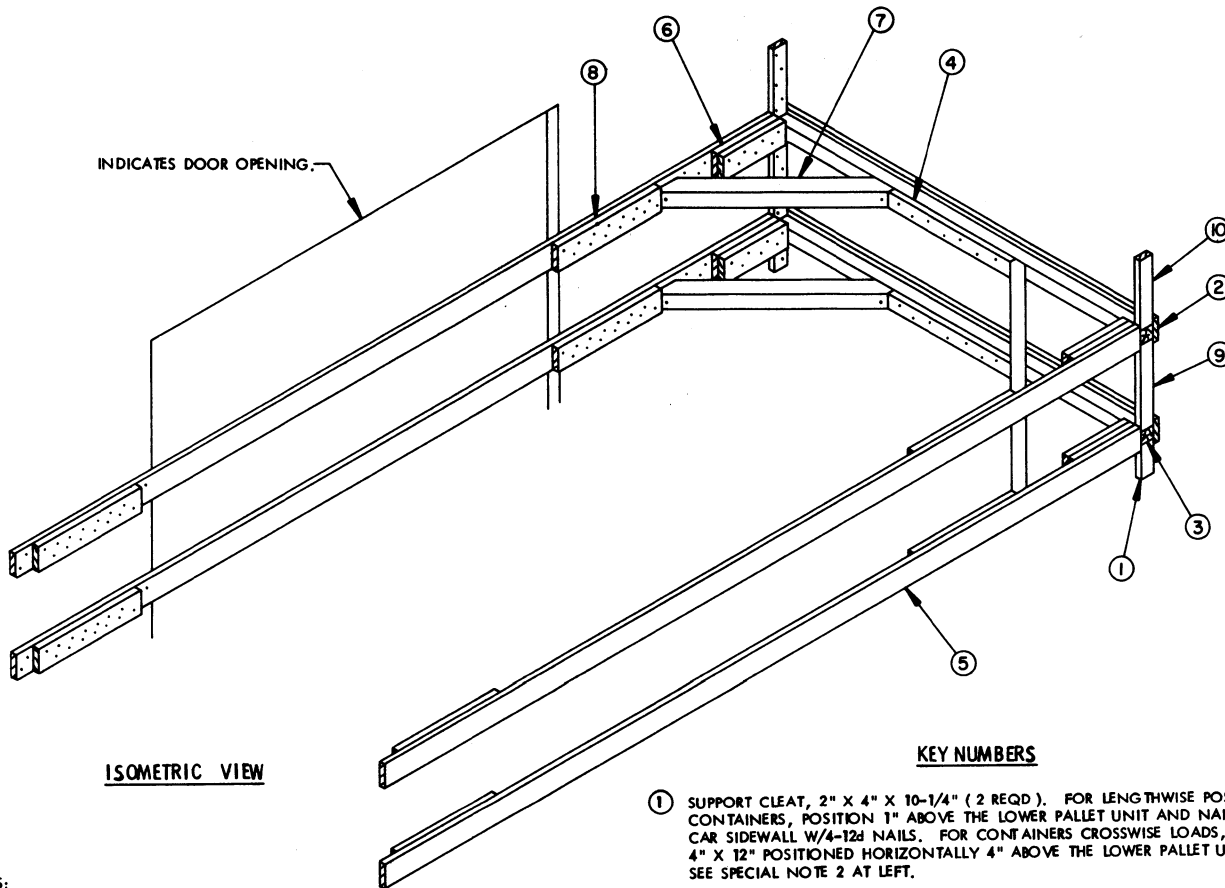
THIS LOAD BEARING GATE IS REQUIRED FOR USE WITH TYPES "A", "B", "C", OR "D" K-BRACING, WHEN THE CONTAINERS ARE POSITIONED LENGTHWISE IN THE CAR.



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.



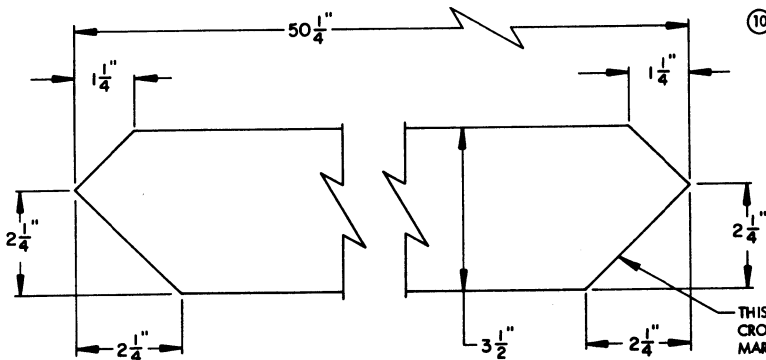
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10-1/4" (2 REQD). FOR LENGTHWISE POSITIONED CONTAINERS, POSITION 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. FOR CONTAINERS CROSSWISE LOADS, USE 2" X 4" X 12" POSITIONED HORIZONTALLY 4" ABOVE THE LOWER PALLET UNITS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ③ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 25" FOR CONTAINERS LENGTHWISE LOADS, 2" X 4" X 31" FOR CONTAINERS CROSSWISE (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

- 1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN TWELVE (12) PALLET UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 41 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 8,000 POUNDS AND 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 39 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 38 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 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
- 4. CAUTION: A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

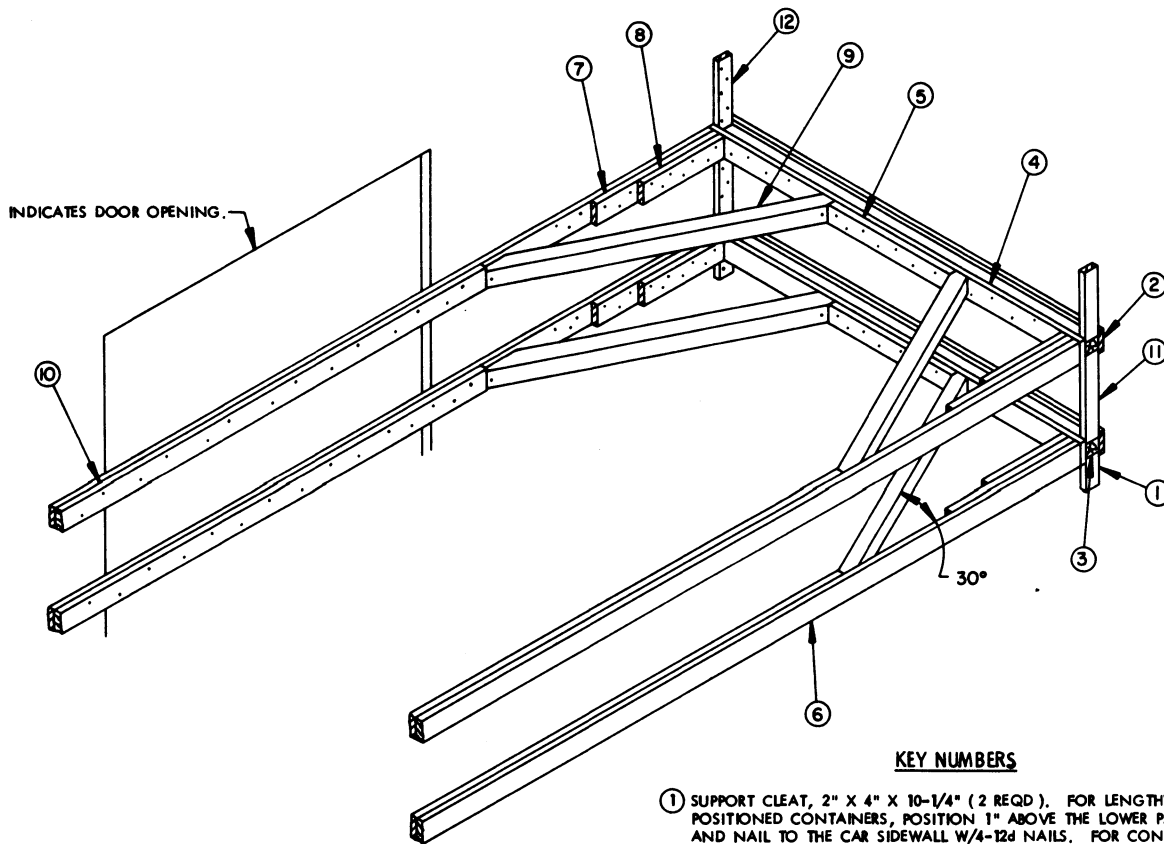


DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "C" BRACE



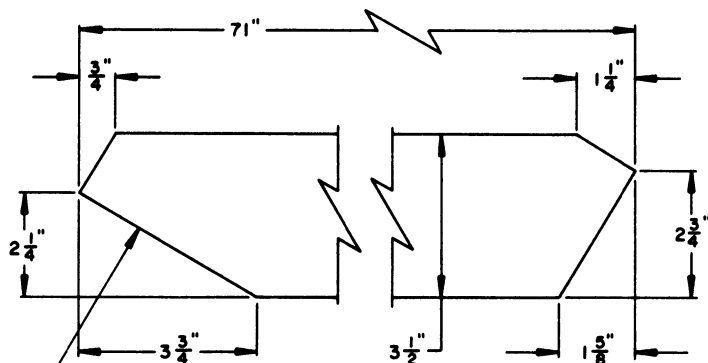
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10-1/4" (2 REQD). FOR LENGTHWISE POSITIONED CONTAINERS, POSITION 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. FOR CONTAINERS CROSSWISE LOADS, USE 2" X 4" X 12" POSITIONED HORIZONTALLY 4" ABOVE THE LOWER PALLET UNIT. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND TO CONTACT THE DIAGONAL BRACE, PIECE MARKED ⑨, IN THE OPPOSITE END OF THE CAR. NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/18-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING, IF APPLICABLE.
- ⑪ SPACER CLEAT, 2" X 4" X 25" FOR CONTAINERS LENGTHWISE LOADS, 2" X 4" X 31" FOR CONTAINERS CROSSWISE (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

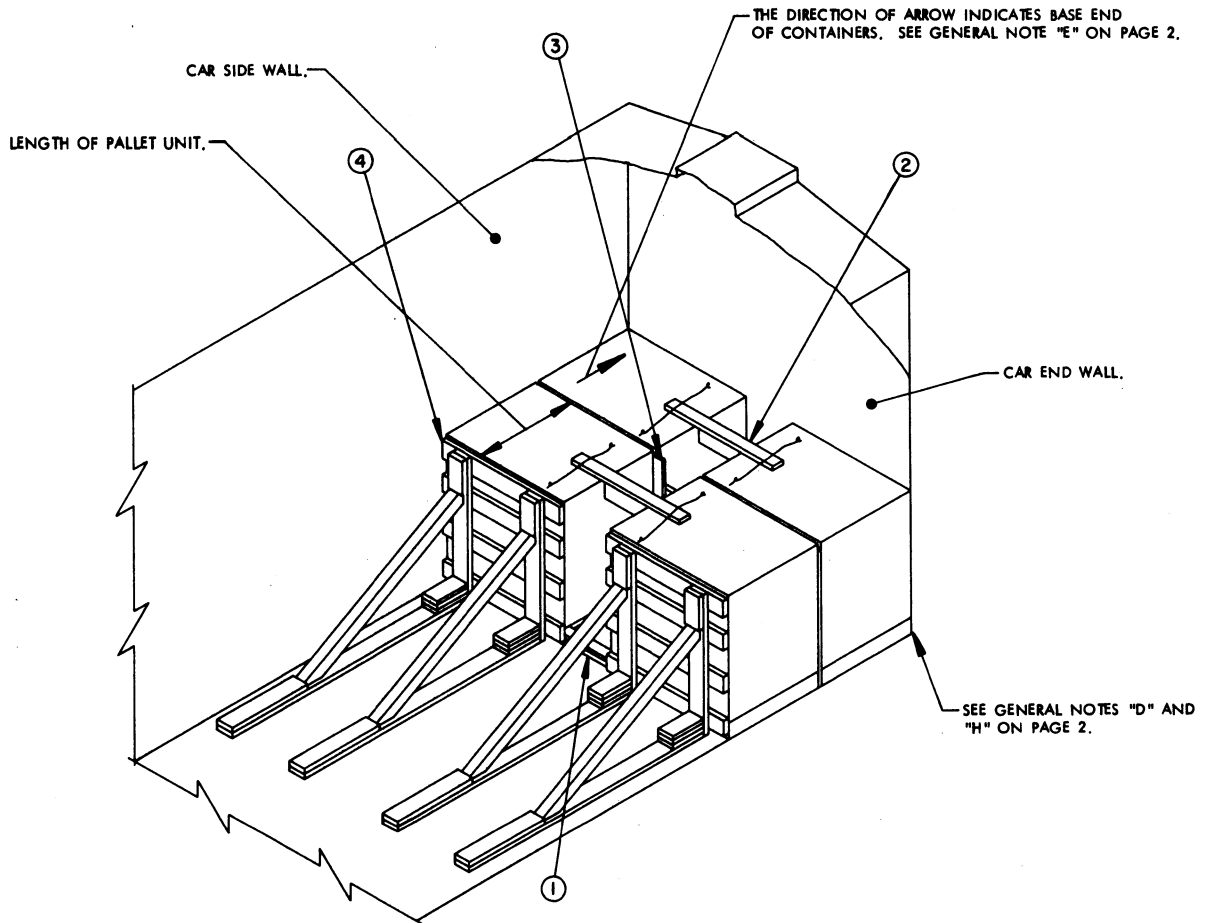
1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN SIXTEEN (16) PALLET UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 40 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 39 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 38 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑩, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS 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 ④ 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 ④ 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



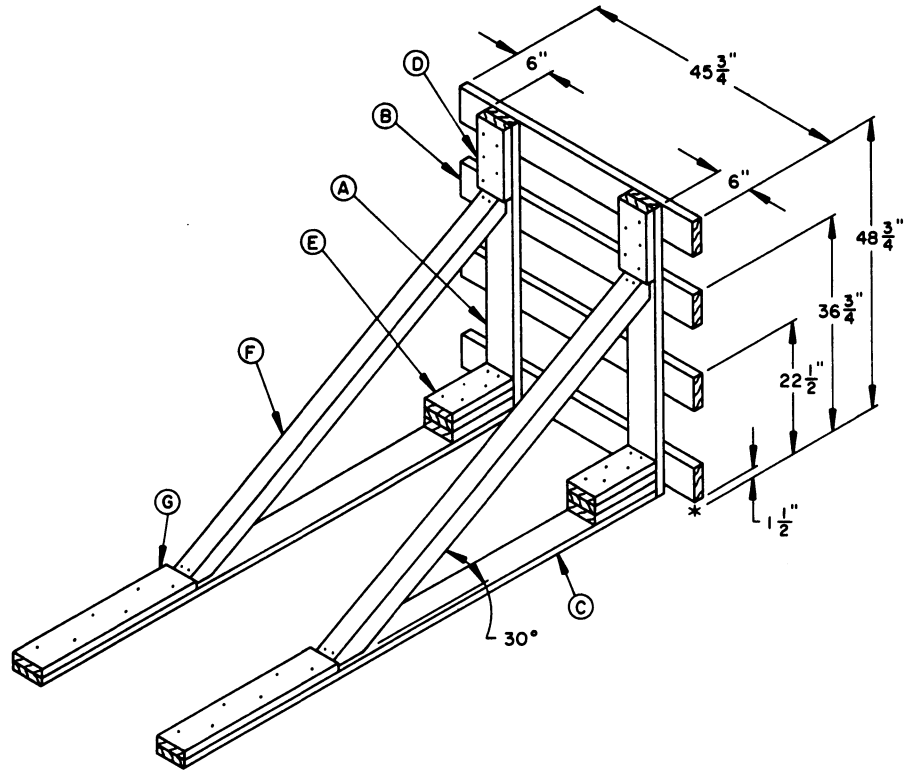
ISOMETRIC VIEW

KEY NUMBERS

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 A METAL LINING CAN BE USED.
2. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 3 ARE NOT EXCEEDED. KNEE BRACE ASSEMBLIES WILL NOT BE USED AGAINST THE NARROW DIMENSION OF THE PALLET UNIT (CONTAINER CROSSWISE).
3. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS.
4. HOLD DOWN CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM HORIZONTAL PIECE OF A KNEE BRACE ASSEMBLY. THE PROPER MATERIAL SIZE AND PLACEMENT WILL BE AS DEPICTED BY THE "CENTER GATE H" DETAIL FOR ONE ROW SPECIFIED ON PAGE 13. FOR HOLD DOWN PIECE, IT IS RECOMMENDED THAT THE MATERIAL BE 2" X 4" OR 2" X 6" DIMENSIONED AND BE NAILER TO THE CAR FLOOR.

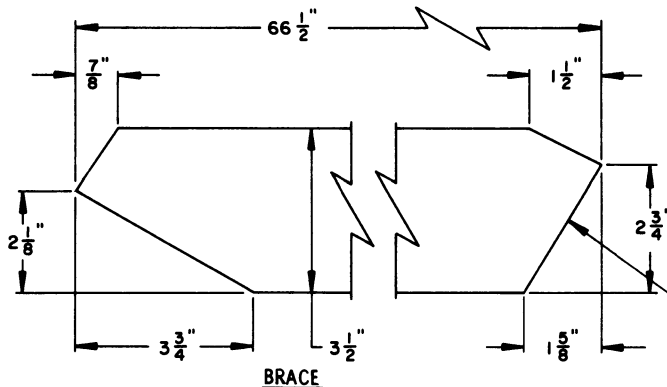
- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 20. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 20. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 51.
- ③ SEPARATOR GATE (1 REQD). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 20 AND/OR THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24.
- ④ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 43 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.



KNEE BRACE ASSEMBLY
(FOR LENGTHWISE POSITIONED CONTAINERS)

KEY LETTERS

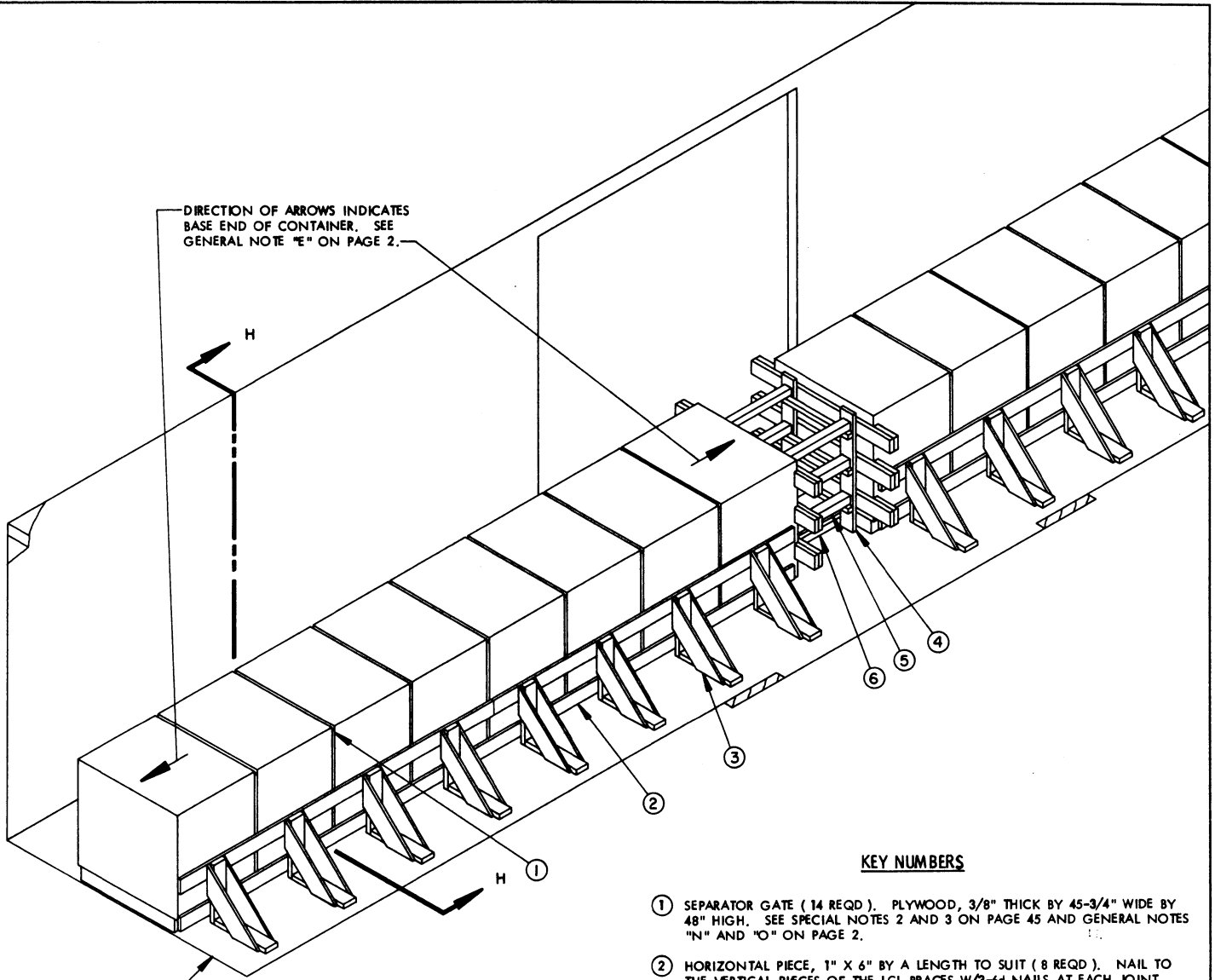
- (A) VERTICAL PIECE, 2" X 6" X 48-3/4" (2 REQD).
- (B) HORIZONTAL PIECE, 2" X 6" X 45-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- (C) FLOOR CLEAT, 2" X 6" X 7'-6" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "T" ON PAGE 2.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 13-1/2" (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 66-1/2" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH JOINT.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT (NOT SHOWN). SEE SPECIAL NOTE 4 ON PAGE 42.



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

4" X 4" MATERIAL

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



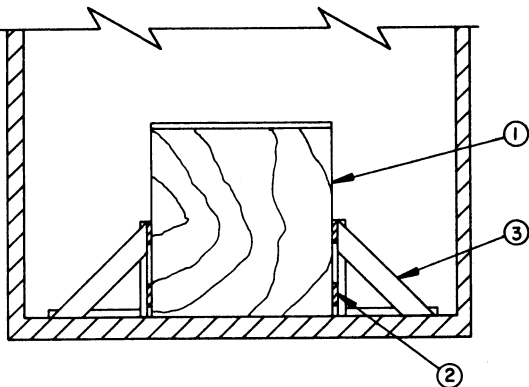
DIRECTION OF ARROWS INDICATES
BASE END OF CONTAINER. SEE
GENERAL NOTE "E" ON PAGE 2.

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

ISOMETRIC VIEW

KEY NUMBERS

- ① SEPARATOR GATE (14 REQD). PLYWOOD, 3/8" THICK BY 45-3/4" WIDE BY 48" HIGH. SEE SPECIAL NOTES 2 AND 3 ON PAGE 45 AND GENERAL NOTES "N" AND "O" ON PAGE 2.
- ② HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 25 FOR HEIGHT LOCATION GUIDANCE.
- ③ LCL BRACE (32 REQD). SEE THE DETAIL ON PAGE 25 AND SPECIAL NOTE 4 ON PAGE 45. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "T" ON PAGE 2.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE E" OR THE "CENTER GATE F" DETAIL ON PAGE 45 FOR LENGTHWISE OR CROSSWISE POSITIONED CONTAINERS, RESPECTIVELY.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (6 REQD FOR LENGTHWISE OR CROSSWISE). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "M" AND "V" ON PAGE 2 AND "W" ON PAGE 3.
- ⑥ GATE HOLD DOWN, 2" X 3" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATE W/2-10d NAILS AT EACH JOINT. SEE THE "CENTER GATE E" DETAIL ON PAGE 45 FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 6 ON PAGE 45.

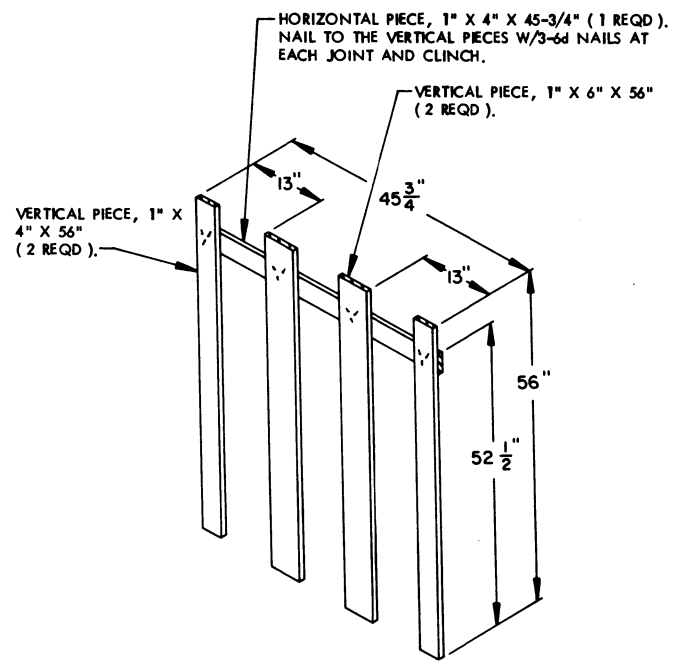


SECTION H-H

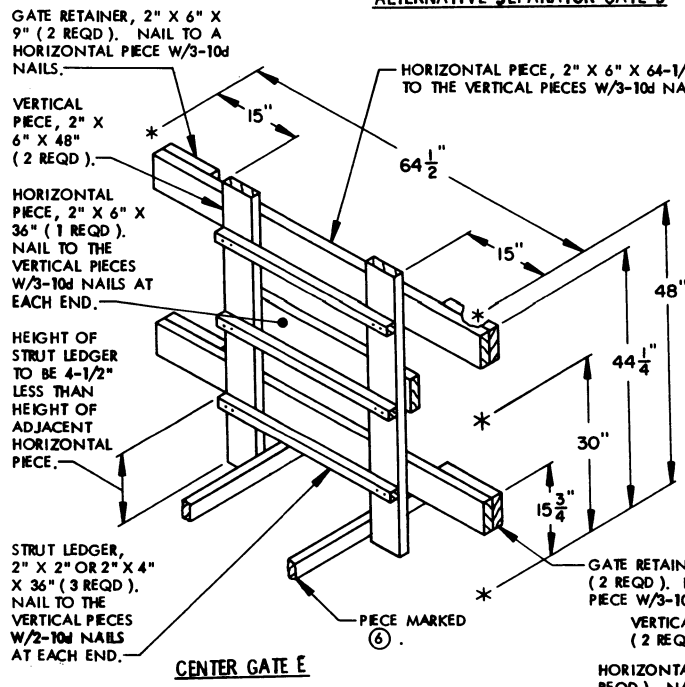
TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. A 1-WIDE CONTAINERS LENGTHWISE LOAD IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR 1-WIDE CONTAINERS CROSSWISE LOADS. NOTE THAT THE SEPARATOR GATES, PIECES MARKED ①, ARE NOT REQUIRED AND THE QUANTITY OF LCL BRACES, PIECES MARKED ③, IS NOT CORRECT FOR CROSSWISE LOADS.
3. THE "ALTERNATIVE SEPARATOR GATE B", AS DETAILED AT LEFT, MAY BE USED IN LIEU OF PLYWOOD SEPARATOR GATES, SHOWN IN THE LOAD ON PAGE 44 AS PIECE MARKED ①.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. THE BRACES WILL BE CENTERED ON THE LENGTH OR WIDTH OF THE UNIT.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.
6. IF DESIRED, GATE HOLD DOWN PIECES WITH THE ASSOCIATED FILL PIECE, AS SHOWN ELSEWHERE ON THE APPLICABLE CENTER GATE FOR A SINGLE ROW, MAY BE USED IN LIEU OF PIECES MARKED ⑥. SEE THE "CENTER GATE G" DETAIL ON PAGE 53 FOR CONTAINERS CROSSWISE OR THE "CENTER GATE H" DETAIL ON THAT PAGE FOR CONTAINERS LENGTHWISE LOAD GATES.



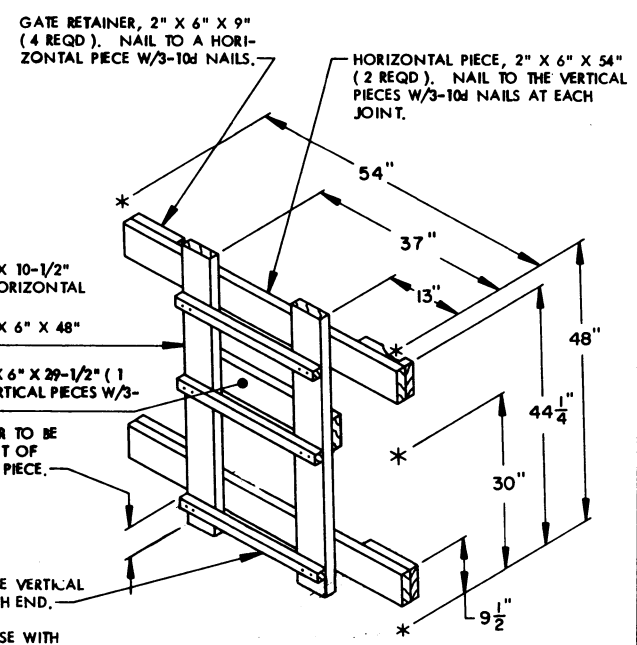
ALTERNATIVE SEPARATOR GATE B



CENTER GATE E

NOTE: THIS GATE IS FOR USE WITH LENGTHWISE POSITIONED CONTAINERS.

BILL OF MATERIAL (TYPICAL)		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	371	186
2" X 2"	18	6
2" X 3"	10	5
2" X 6"	178	178
4" X 4"	16	22
NAILS	NO. REQD	POUNDS
6d (2")	192	1-1/4
8d (2-1/2")	384	4
10d (3")	92	1-1/2
16d (3-1/2")	248	5-1/2
PLYWOOD, 3/8" THICK-----214 SQ FT REQD-----220 LBS		



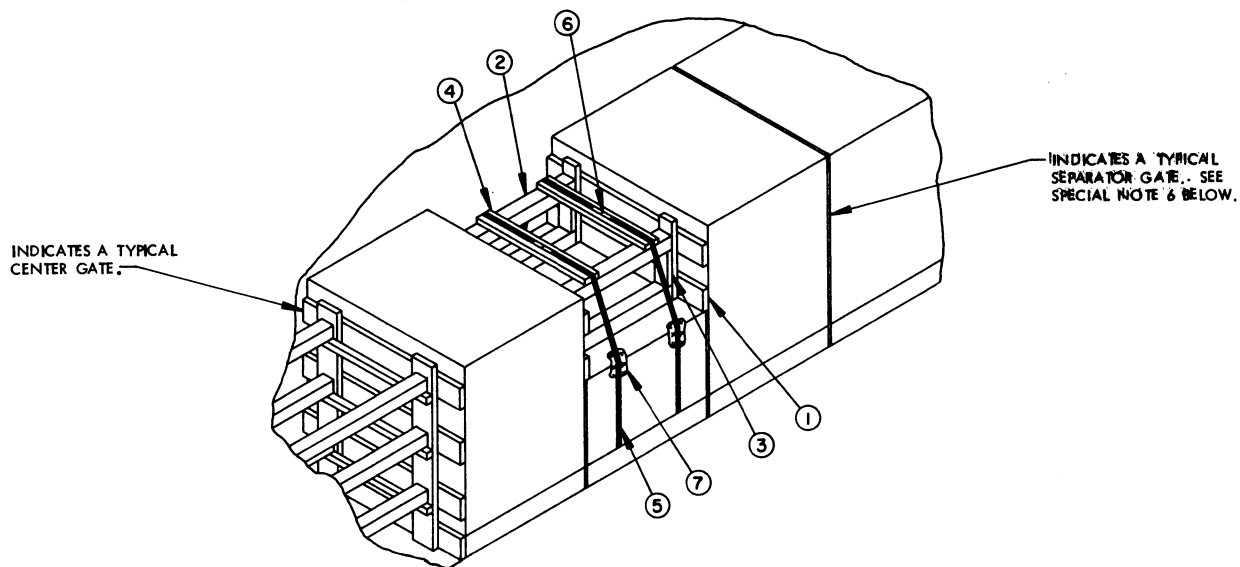
CENTER GATE F

NOTE: THIS GATE IS FOR USE WITH CROSSWISE POSITIONED CONTAINERS. A RIGHT HAND AND A LEFT HAND GATE ARE REQUIRED. A RIGHT HAND GATE IS SHOWN.

LOAD AS SHOWN (TYPICAL)

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	16	24,640 LBS
DUNNAGE		1,026 LBS
TOTAL WEIGHT		25,666 LBS (APPROX)

TYPICAL LCL LOAD USING 1-WIDE LOADING METHOD



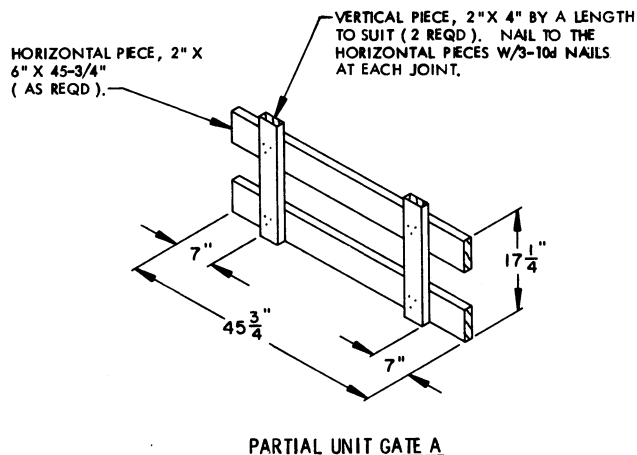
**POSITIONING OF PARTIAL CONTAINERS-
LENGTHWISE UNIT WITHIN A LAYER**

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LENGTHWISE CONTAINERS' LOAD.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED PROPELLING CHARGES WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/24-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
4. THE FILLERS AS REFERENCED IN SPECIAL NOTE 3 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION, OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
5. THE "POSITIONING OF PARTIAL CONTAINERS LENGTHWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. THE SEPARATOR GATE AT EACH END OF THE PARTIAL UNIT WILL BE THE SAME HEIGHT AS THE PARTIAL UNIT. MODIFY THE PLACEMENT OF OR OMIT THE UPPER TIE PIECE ON THE SEPARATOR GATE, AS APPLICABLE.

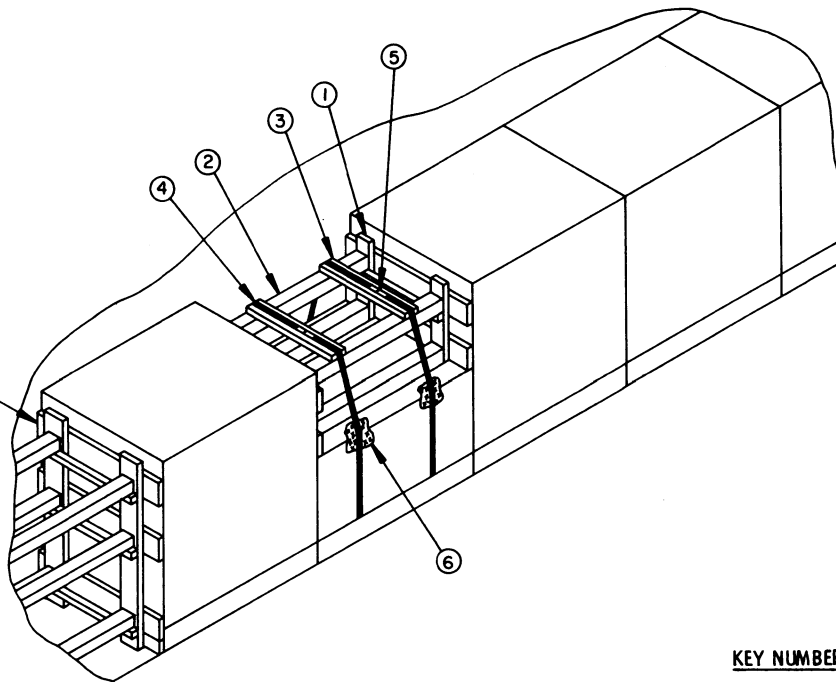
KEY NUMBERS

- ① PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② STRUT, 4" X 4" X 3/8" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL UNIT GATE W/2-16d NAILS AT EACH END.
- ③ STRUT SUPPORT PIECE, 2" X 4" X 9-1/4" (4 REQD). NAIL TO A VERTICAL PIECE OF THE PARTIAL UNIT GATE W/3-10d NAILS.
- ④ STRAPPING BOARD, 2" X 4" X 31-3/4" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- ⑤ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE PALLET.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). SEE GENERAL NOTE "P" ON PAGE 2.
- ⑦ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.



PARTIAL UNIT GATE A

INDICATES A TYPICAL CENTER GATE.



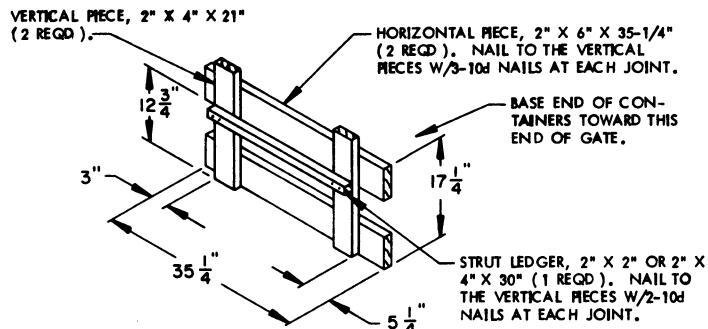
POSITIONING OF PARTIAL CONTAINERS-CROSSWISE UNIT IN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CROSSWISE CONTAINERS LOAD.
2. A LESS-THAN-FULL HEIGHT PALLET UNIT OF CROSSWISE-POSITIONED PROPELLING CHARGES WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
3. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/24-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
4. THE FILLERS AS REFERENCED IN SPECIAL NOTE 3 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION, OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
5. THE "POSITIONING OF A PARTIAL CONTAINERS CROSSWISE UNIT IN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
6. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 49 MAY BE MORE ECONOMICAL.

KEY NUMBERS

- ① PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 2 AT LEFT.
- ② STRUT, 4" X 4" X 39-3/4" (4 REQD). TOENAIL TO THE PARTIAL UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ STRAPPING BOARD, 2" X 4" X 27" (2 REQD). NAIL TO THE STRUTS, PIECE MARKED ②, W/3-10d NAILS AT EACH JOINT.
- ④ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑤ SEAL FOR 1-1/8" STRAPPING (4 REQD, 2 PER STRAP). SEE GENERAL NOTE "P" ON PAGE 2.
- ⑥ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.



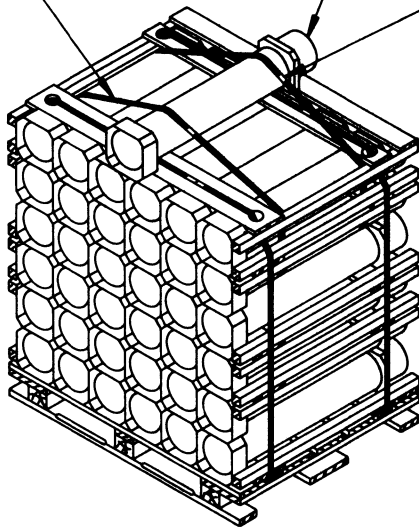
PARTIAL UNIT GATE B

ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED. A RIGHT HAND GATE IS SHOWN.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 11'-0" LONG STEEL STRAPPING (2 REQD.).

POSITION CONTAINER SO AS TO BE CENTERED ON THE WIDTH OF THE UNIT.

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

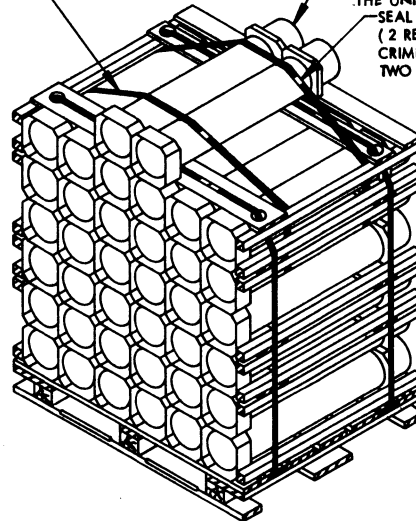


SECUREMENT OF ONE CONTAINER

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 11'-6" LONG STEEL STRAPPING (2 REQD.).

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

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



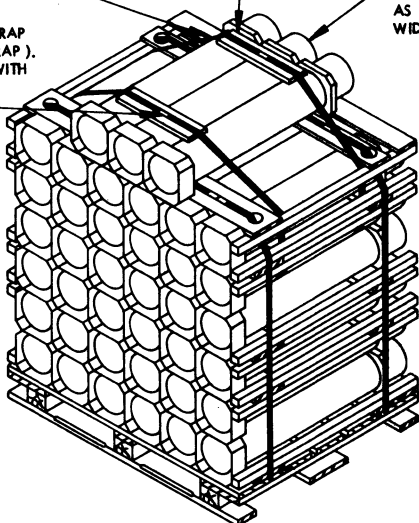
SECUREMENT OF TWO CONTAINERS

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 12'-0" LONG STEEL STRAPPING (2 REQD.).

STRAPPING BOARD, 1" X 4" X 14-1/4" FOR THREE CONTAINERS, 21-1/2" FOR FOUR CONTAINERS, 28-1/2" FOR FIVE CONTAINERS (2 REQD.).

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

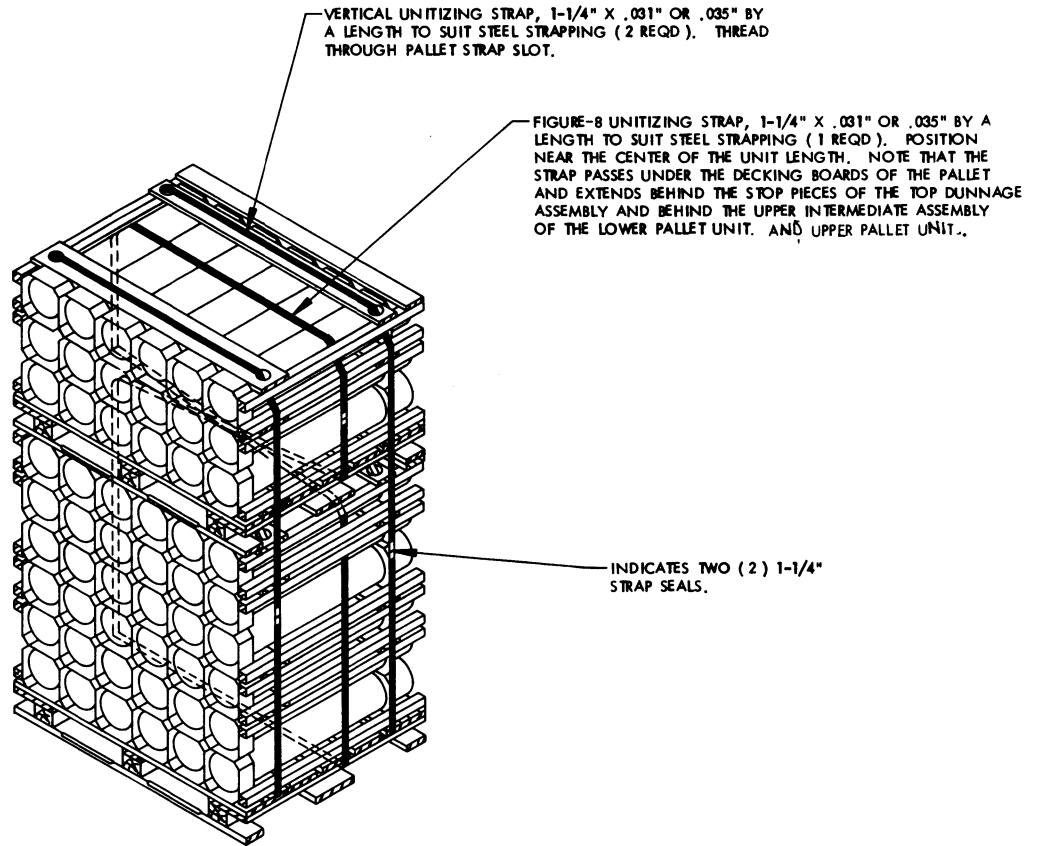
SEAL FOR 1-1/4" STRAP (2 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.



SECUREMENT OF THREE CONTAINERS

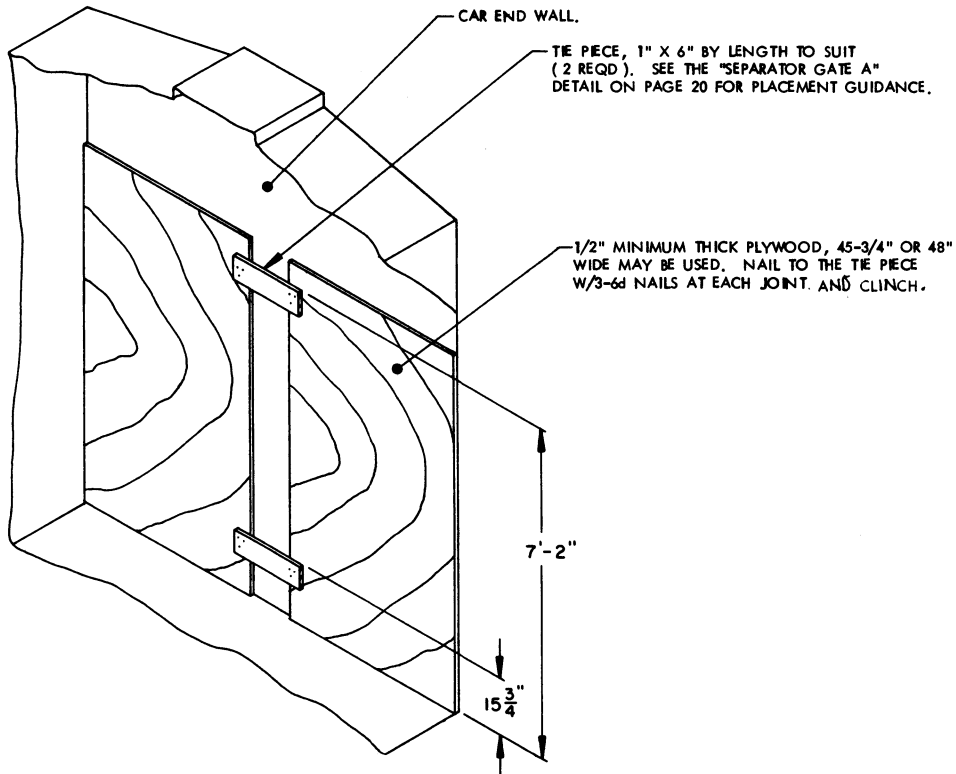
SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES 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 49 OR WITHIN A LAYER AS SHOWN ON PAGES 46 AND 47.
2. SHIPMENT OF LEFT-OVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. **CAUTION:** A LOAD CONTAINING LEFT-OVER 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 LEFT-OVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.



SECUREMENT OF PARTIAL UNIT ON TOP

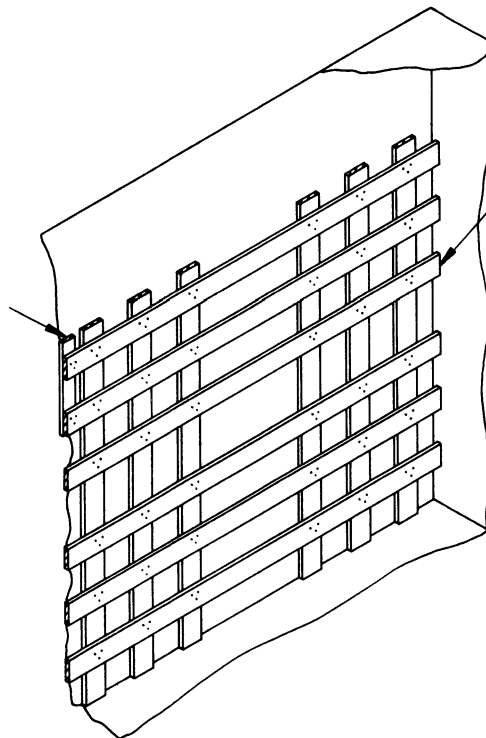
THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CONTAINERS-CROSSWISE LOAD. CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN THREE (3) LAYERS OF CONTAINERS. FOR SHIPMENT OF MORE THAN THREE LAYERS OF CONTAINERS, OR AN ALTERNATIVE METHOD FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGE 47.



END WALL LINING

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

STOP PIECE, 1" X 4" X 24" (1 REQD). NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH. STOP PIECES ARE REQUIRED AT EACH END OF EACH ADDITIONAL ASSEMBLY.



SIDEWALL LINING

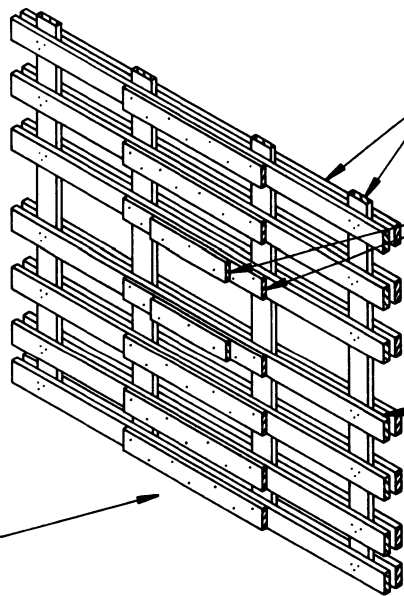
THIS VIEW DEPICTS LINING REQUIRED FOR A CONTAINER CROSSWISE SHIPMENT IN A CAR EQUIPPED WITH A STEEL SIDEWALL. NOTE THAT IF THE CAR IS EQUIPPED WITH A STEEL-FACED PLUG DOOR, LINING WILL ALSO BE REQUIRED IN THE DOORWAY AREA IF THE SPECIFIED DOORWAY PROTECTION DOES NOT SUFFICE.

SEE THE "ALTERNATIVE SEPARATOR GATE A" DETAIL ON PAGE 24 FOR CONSTRUCTION DETAILS. OMIT THE ANTI-SWAY BRACE STOP PIECES.

DETAILS

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 THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A CENTER GATE "A", AS DETAILED ON PAGE 21 IS SHOWN AS TYPICAL.



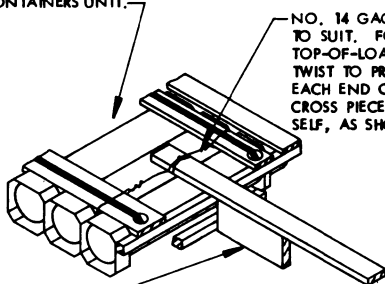
THESE 2" X 6" HORIZONTAL PIECES AND VERTICAL PIECES ARE PART OF THE CENTER GATE "A" DETAIL ON PAGE 21.

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

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

POSITION THIS SIDE OF BULKHEAD AGAINST THE CAR END WALL.

PARTIAL VIEW SHOWING TOP LAYER OF A LENGTHWISE CONTAINERS UNIT.



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

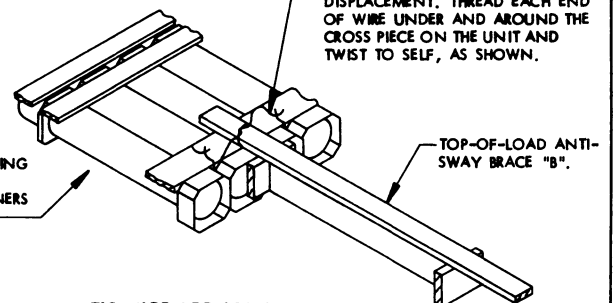
TIE WIRE APPLICATION A

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

END-OF-CAR BULKHEAD

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

PARTIAL VIEW SHOWING TOP LAYER OF A CROSSWISE CONTAINERS UNIT.

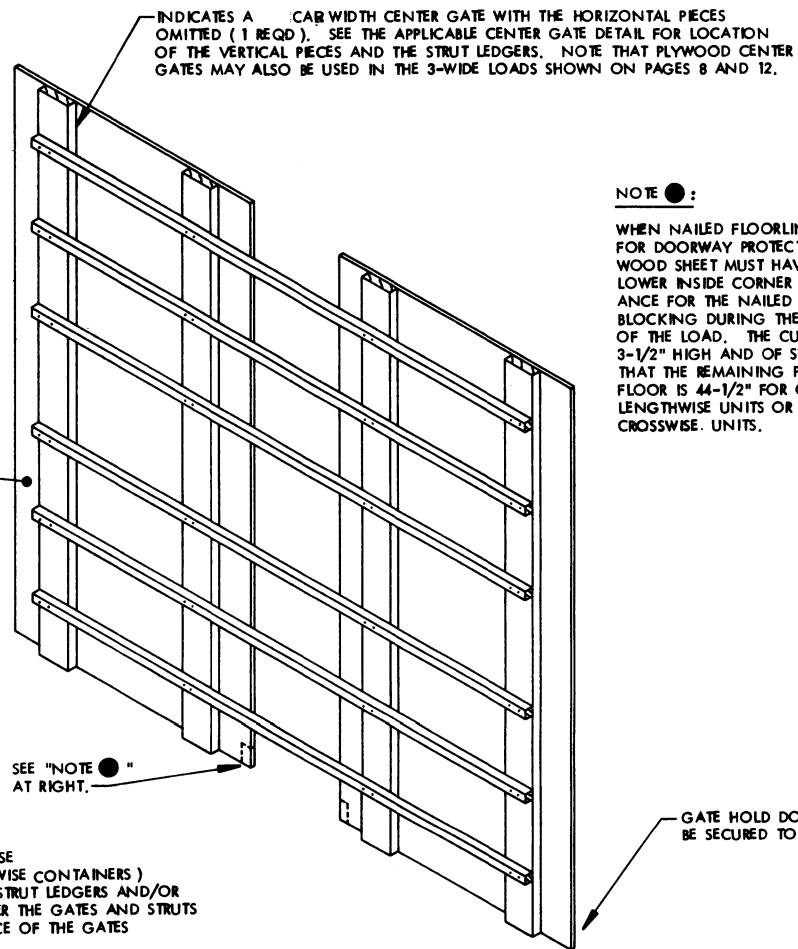


TOP-OF-LOAD ANTI-SWAY BRACE "B".

TIE WIRE APPLICATION B

DETAILS

PLYWOOD, 1/2" THICK BY THE UNIT WIDTH OR LENGTH BY THE LOAD HEIGHT (2 OR 3 REQD AS APPLICABLE). 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 6 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 10. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.



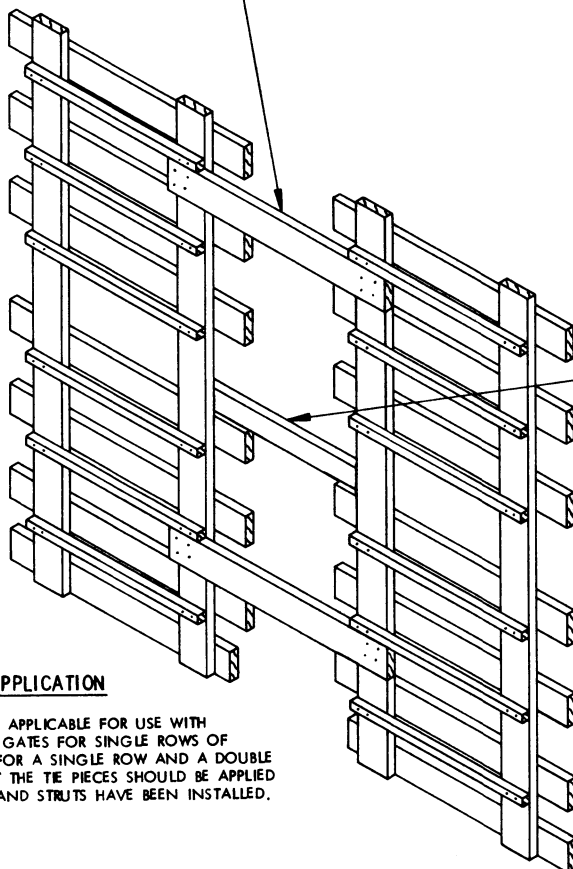
NOTE ●:

WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, EACH PLYWOOD SHEET MUST HAVE A CUTOUT AT THE LOWER INSIDE CORNER TO PROVIDE CLEARANCE FOR THE NAILED FLOORLINE BLOCKING DURING THE NORMAL SHIFTING OF THE LOAD. THE CUTOUT MUST BE 3-1/2" HIGH AND OF SUFFICIENT WIDTH SO THAT THE REMAINING PLYWOOD AT THE FLOOR IS 44-1/2" FOR CONTAINERS LENGTHWISE UNITS OR 34-1/2" FOR CROSSWISE UNITS.

TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (REF: 59" FOR A 2-WIDE LOAD OF CROSSWISE CONTAINERS, " FOR A 3-WIDE LOAD OF CROSSWISE CONTAINERS, 46" FOR A 2-WIDE LOAD OF LENGTHWISE CONTAINERS) (2 REQD). POSITION UNDER THE UPPER LEVEL OF STRUT LEDGERS AND/OR ABOVE THE LOWER LEVEL OF INSTALLED STRUTS AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED. NAIL TO THE VERTICAL PIECE OF THE GATES W/4-10d NAILS AT EACH END.

PLYWOOD CENTER GATE ALTERNATIVE

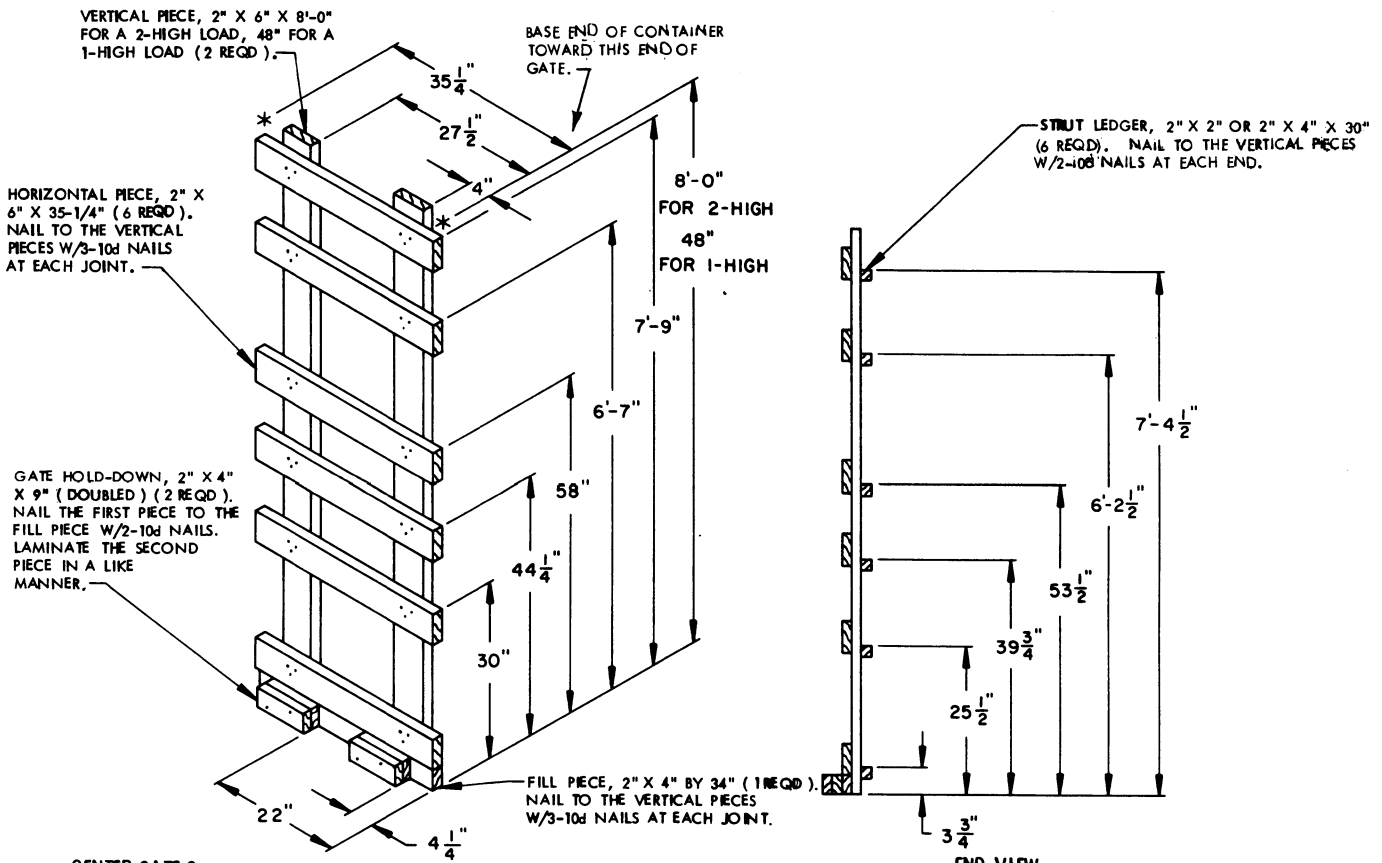
CENTER GATE "A" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW OR FOR TWO ROWS.



TIE PIECE APPLICATION

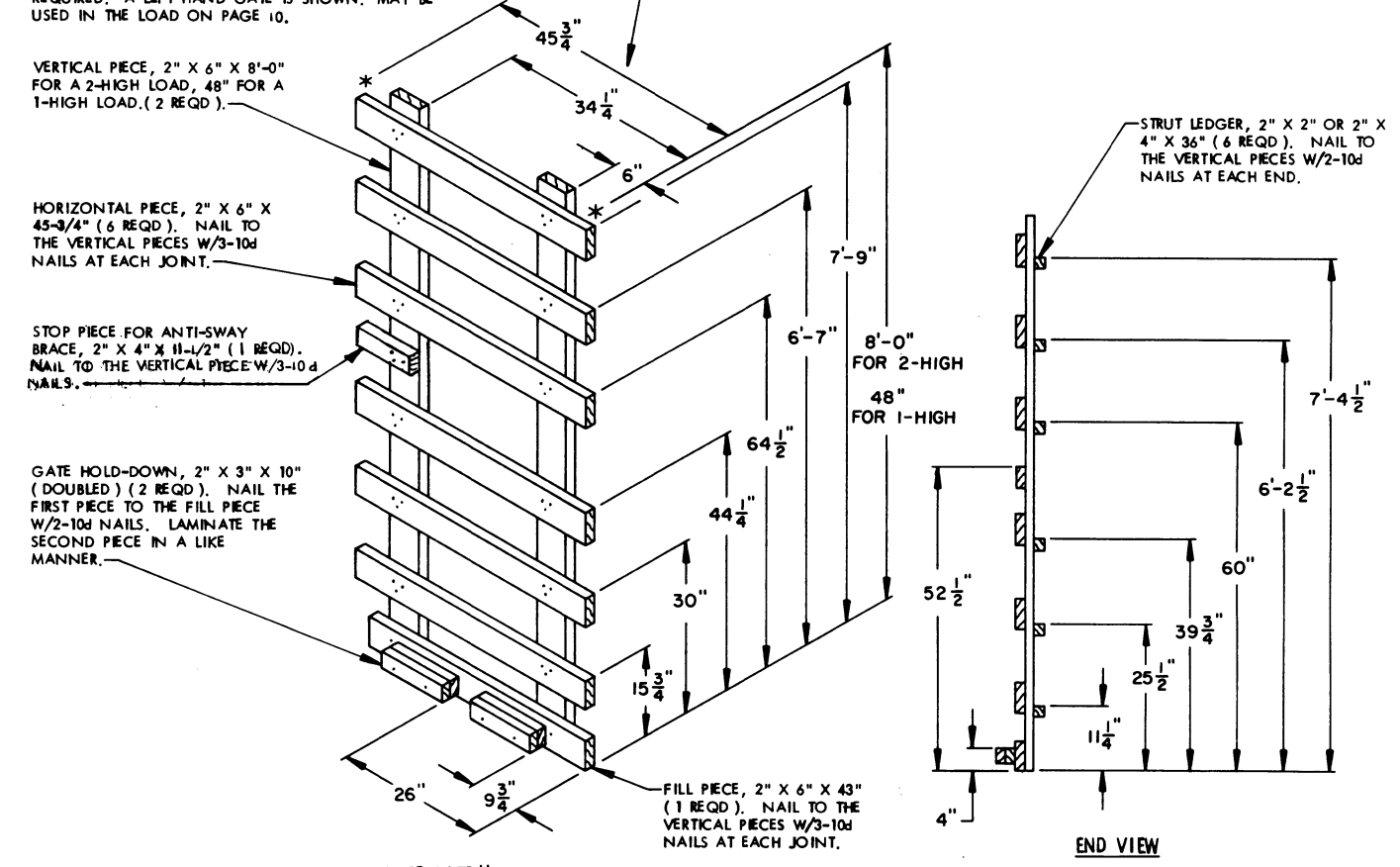
THIS PROCEDURE IS APPLICABLE FOR USE WITH ANY TWO CENTER GATES FOR SINGLE ROWS OF PALLET UNITS OR FOR A SINGLE ROW AND A DOUBLE ROW. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.

DETAILS



ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED. A LEFT HAND GATE IS SHOWN. MAY BE USED IN THE LOAD ON PAGE 10.

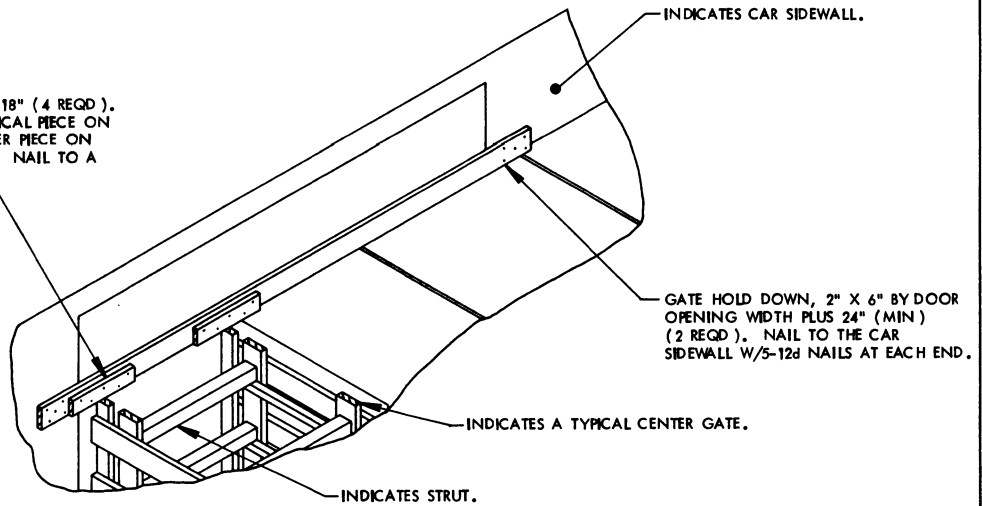
NOTE: POSITION THIS END OF GATE AGAINST THE CAR SIDEWALL.



CENTER GATE H

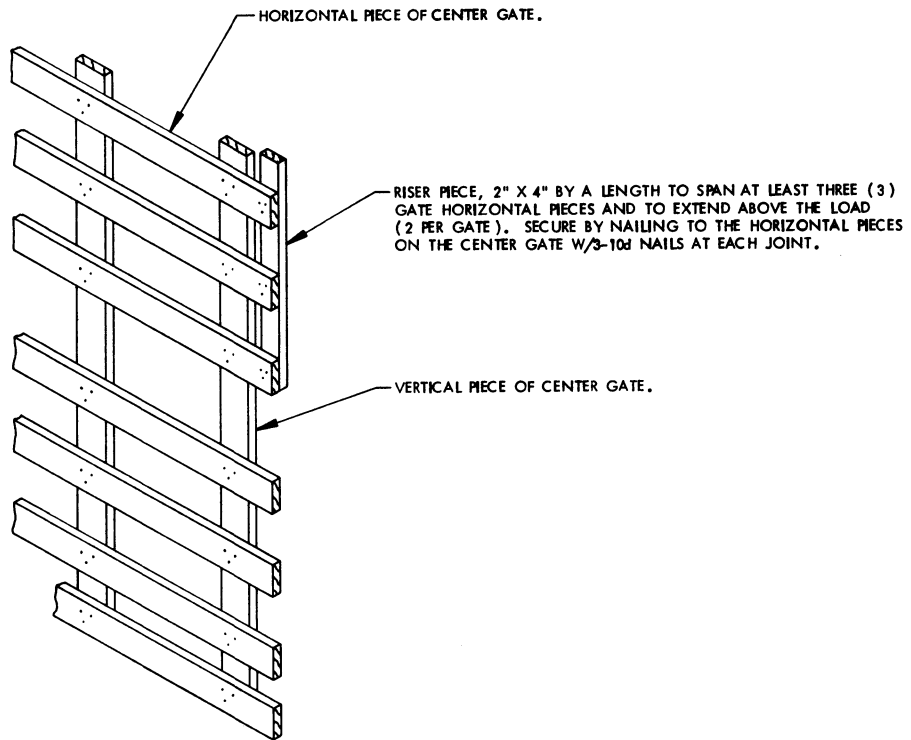
DETAILS

GATE-HOLD DOWN CLEAT, 2" X 4" X 18" (4 REQD). CENTER A CLEAT ABOVE THE END VERTICAL PIECE ON THE CENTER GATE, OR ABOVE THE RISER PIECE ON A GATE MODIFIED AS SHOWN BELOW. NAIL TO A GATE HOLD-DOWN W/3-10d NAILS.



ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD DOWN WHICH CAN BE USED IF DESIRED, PROVIDING THE CAR HAS NAILABLE SIDEWALLS. THIS METHOD MAY BE APPLIED IN LIEU OF USING THE GATE HOLD DOWN PIECES WHICH ARE PART OF A CENTER GATE. **NOTE:** FOR A GATE NOT LOCATED IN OR NEAR THE DOORWAY AREA, THE GATE HOLD DOWN CLEAT MAY BE DOUBLED AND NAILED TO THE CAR SIDEWALL TO PROVIDE A HOLD DOWN.



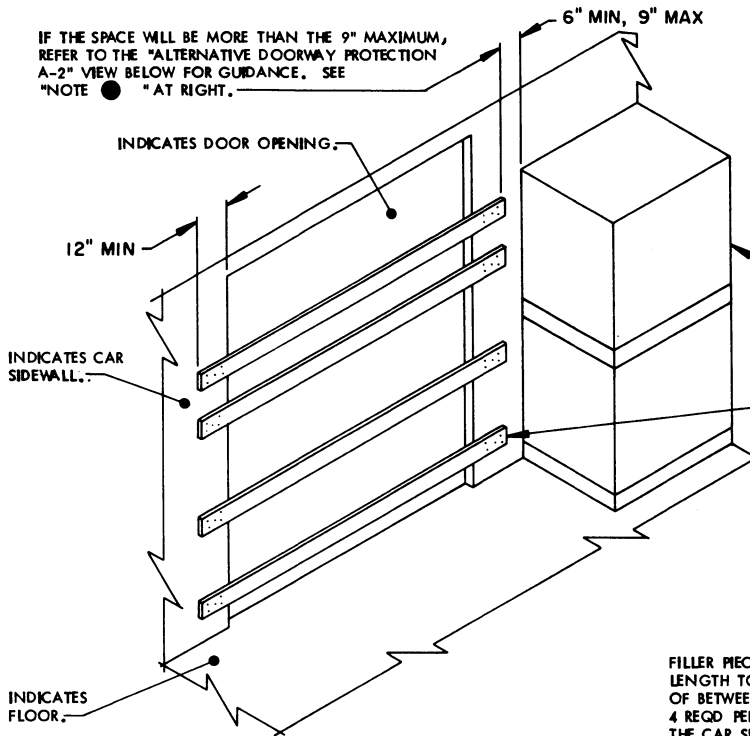
CENTER GATE MODIFICATION

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

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 RIGHT.

NOTE ● :

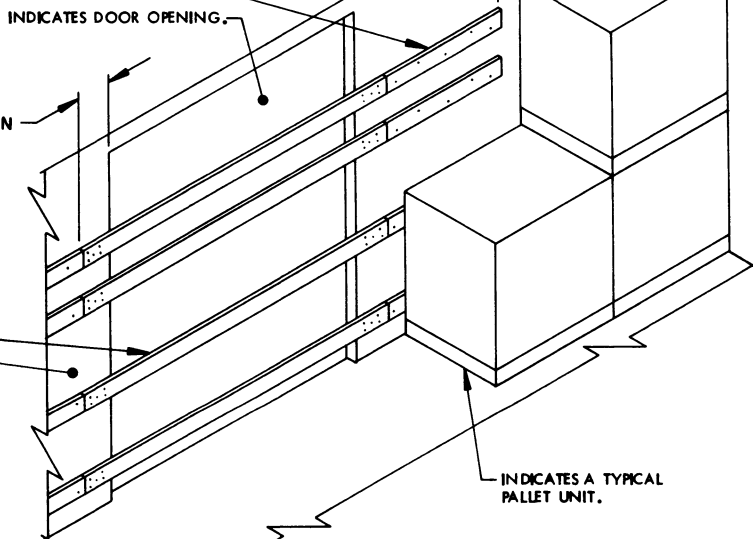
THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT, AND IS APPLICABLE WHEN ANTI-SWAY BRACING IS USED FOR A LOAD AND ALSO WHEN THE EXCESS SPACE ACROSS THE CAR IS SMALL ENOUGH THAT ANTI-SWAY BRACING OF ANY KIND IS NOT REQUIRED. AN EXCESS LATERAL SPACE OF 6" OR LESS MAY BE FILLED BY NAILING LUMBER TO THE CAR SIDEWALL. THE DOOR SPANNERS WILL BE POSITIONED TO BUTT AGAINST THE FILL MATERIAL AND THE TOLERANCE DIMENSION WILL NOT APPLY. ALSO, THE FILLER PIECES SHOWN IN THE "ALTERNATIVE DOORWAY PROTECTION A-2" VIEW WILL NOT BE USED. NOTE THAT THE THICKNESS OF THE DOOR SPANNER PIECES MUST EQUAL THE THICKNESS OF THE LUMBER FILL MATERIAL THAT IS NAILED TO THE CAR SIDEWALL.



ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS, HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE "ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 56. OR NAILED DOWN BLOCKING AND STEEL STRAPPING METHOD AS SHOWN IN THE LOAD ON PAGE 18.

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

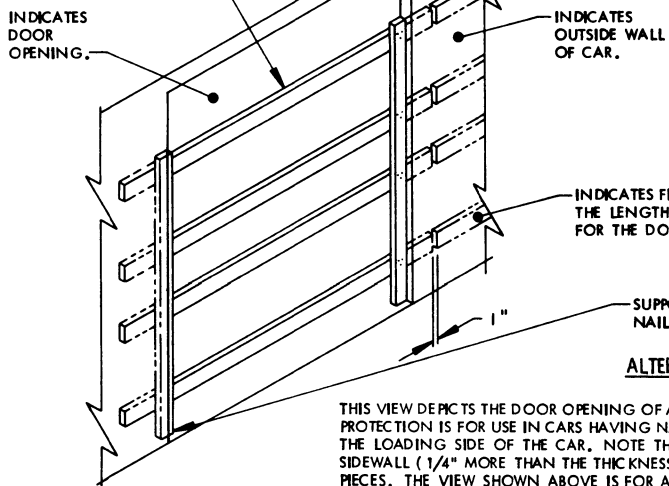


ALTERNATIVE DOORWAY PROTECTION A-2

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.

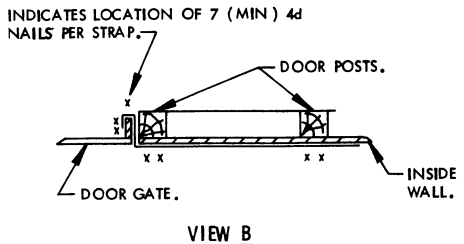
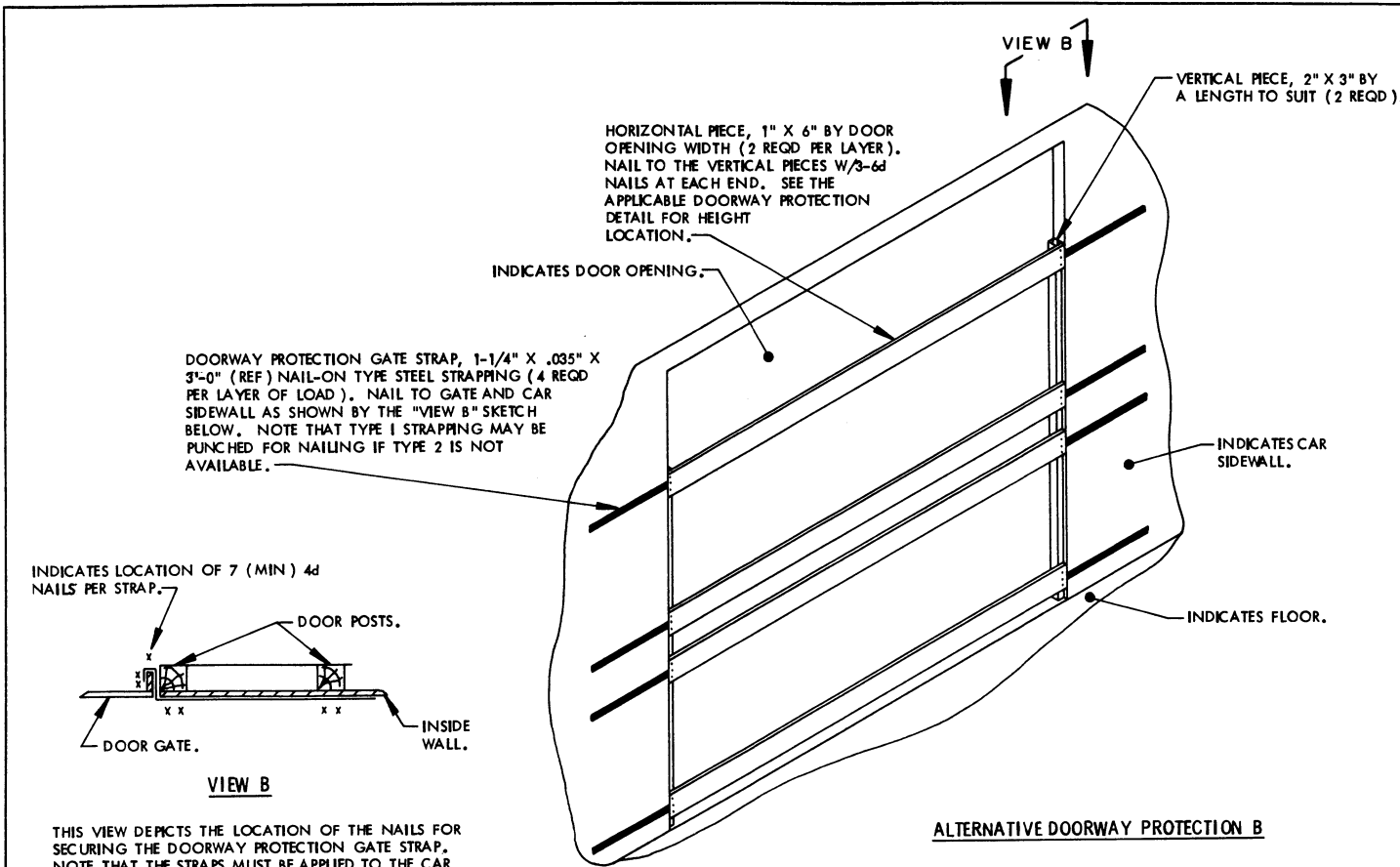
DOOR SPANNER, 2" (MIN) X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD PER LAYER). POSITION SO AS TO MATCH THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE APPLICABLE DOORWAY PROTECTION DETAIL. SEE "NOTE ● " ABOVE.

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



ALTERNATIVE DOORWAY PROTECTION A-3

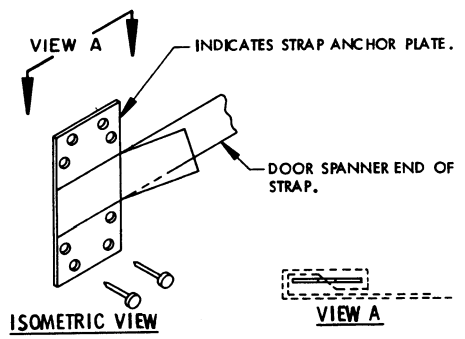
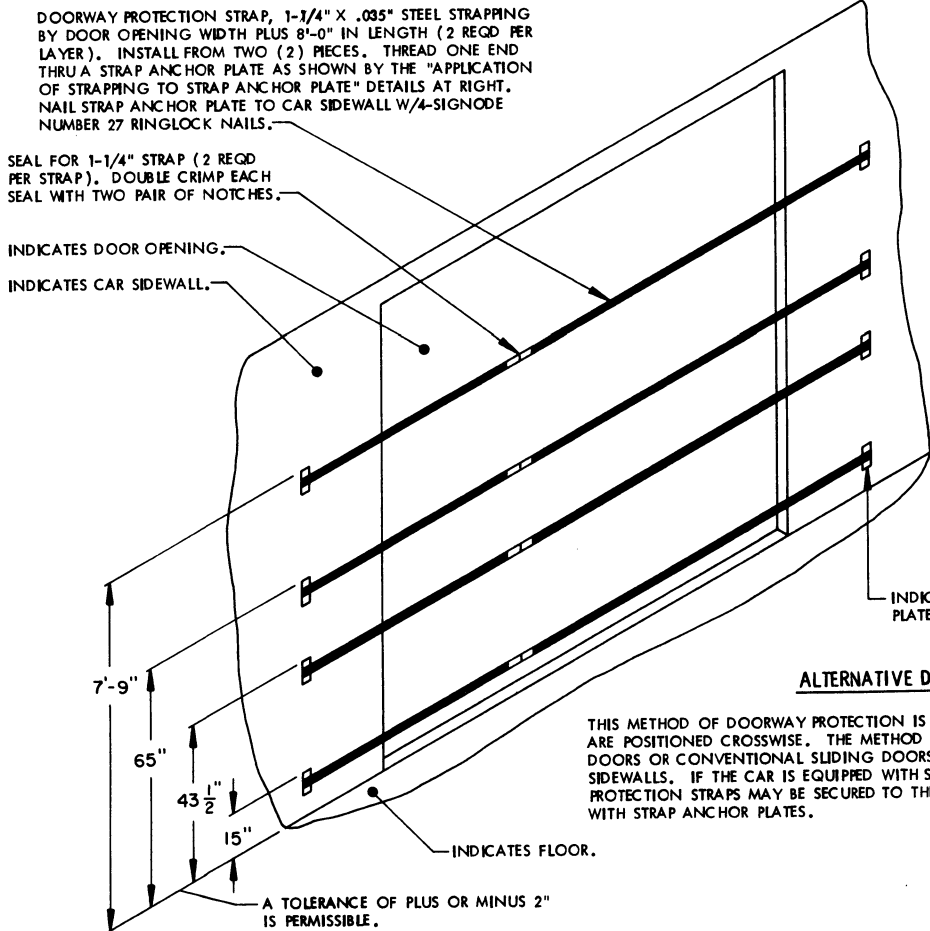
THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT FROM OUTSIDE OF THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET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



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

ALTERNATIVE DOORWAY PROTECTION B

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

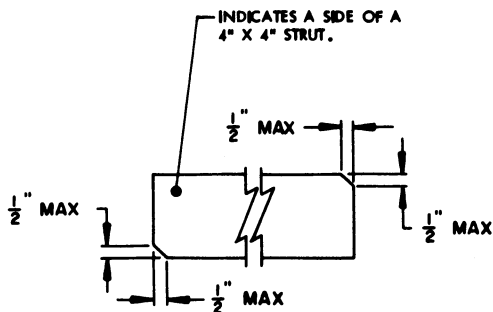


APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

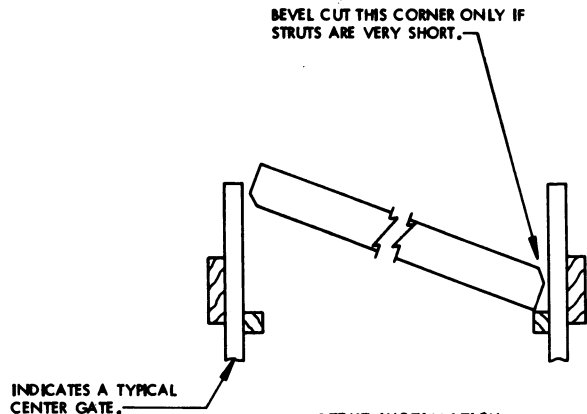
ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH THOSE LOADS IN WHICH THE CONTAINERS 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 DOOR POSTS, THE DOORWAY PROTECTION STRAPS MAY BE SECURED TO THESE RODS IN LIEU OF ATTACHING TO THE CAR SIDEWALL WITH STRAP ANCHOR PLATES.



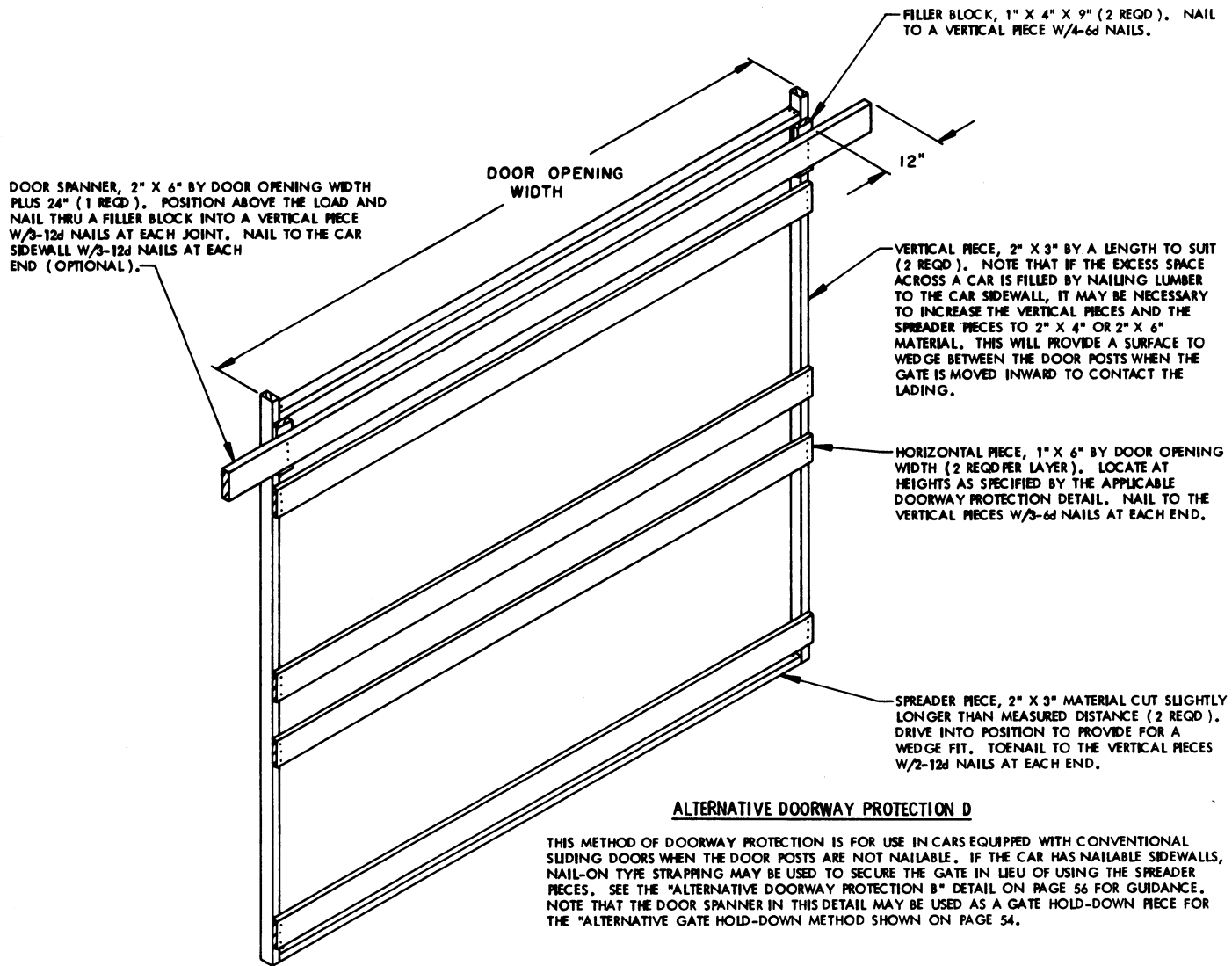
BEVEL CUT

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 "W" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



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).

DOOR OPENING WIDTH

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

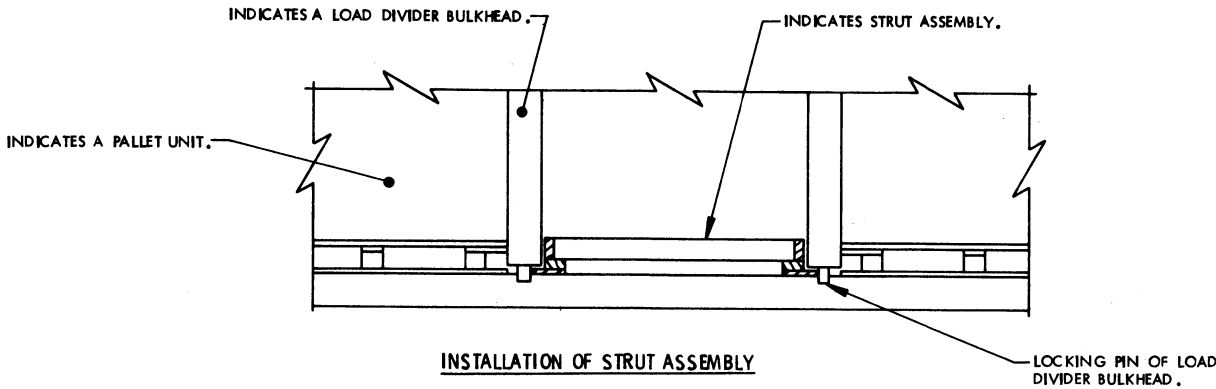
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD). NOTE THAT IF THE EXCESS SPACE ACROSS A CAR IS FILLED BY NAILING LUMBER TO THE CAR SIDEWALL, IT MAY BE NECESSARY TO INCREASE THE VERTICAL PIECES AND THE SPREADER PIECES TO 2" X 4" OR 2" X 6" MATERIAL. THIS WILL PROVIDE A SURFACE TO WEDGE BETWEEN THE DOOR POSTS WHEN THE GATE IS MOVED INWARD TO CONTACT THE LADING.

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

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

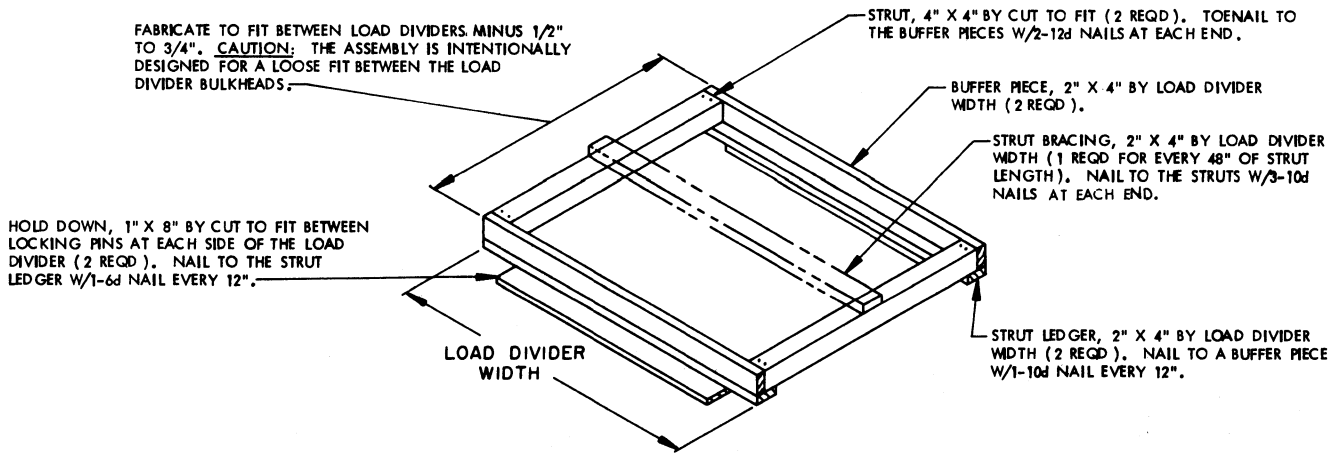
ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 56 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 54.



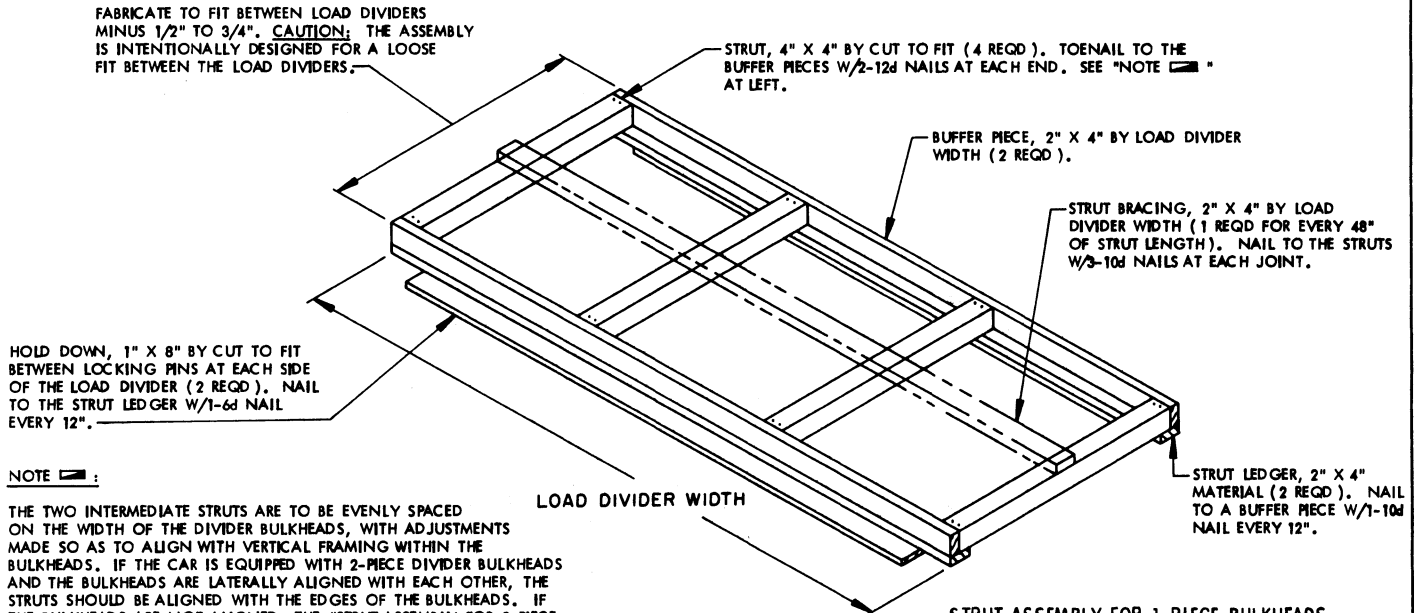
INSTALLATION OF STRUT ASSEMBLY

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

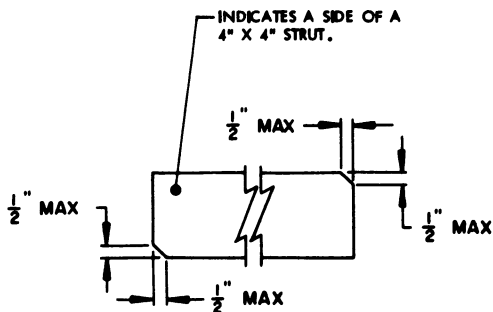


STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

NOTE [] :

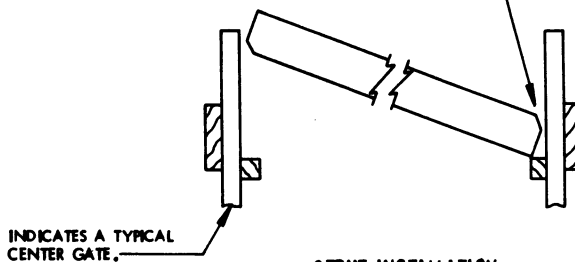
THE TWO INTERMEDIATE STRUTS ARE TO BE EVENLY SPACED ON THE WIDTH OF THE DIVIDER BULKHEADS, WITH ADJUSTMENTS MADE SO AS TO ALIGN WITH VERTICAL FRAMING WITHIN THE BULKHEADS. IF THE CAR IS EQUIPPED WITH 2-PIECE DIVIDER BULKHEADS AND THE BULKHEADS ARE LATERALLY ALIGNED WITH EACH OTHER, THE STRUTS SHOULD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



BEVEL CUT

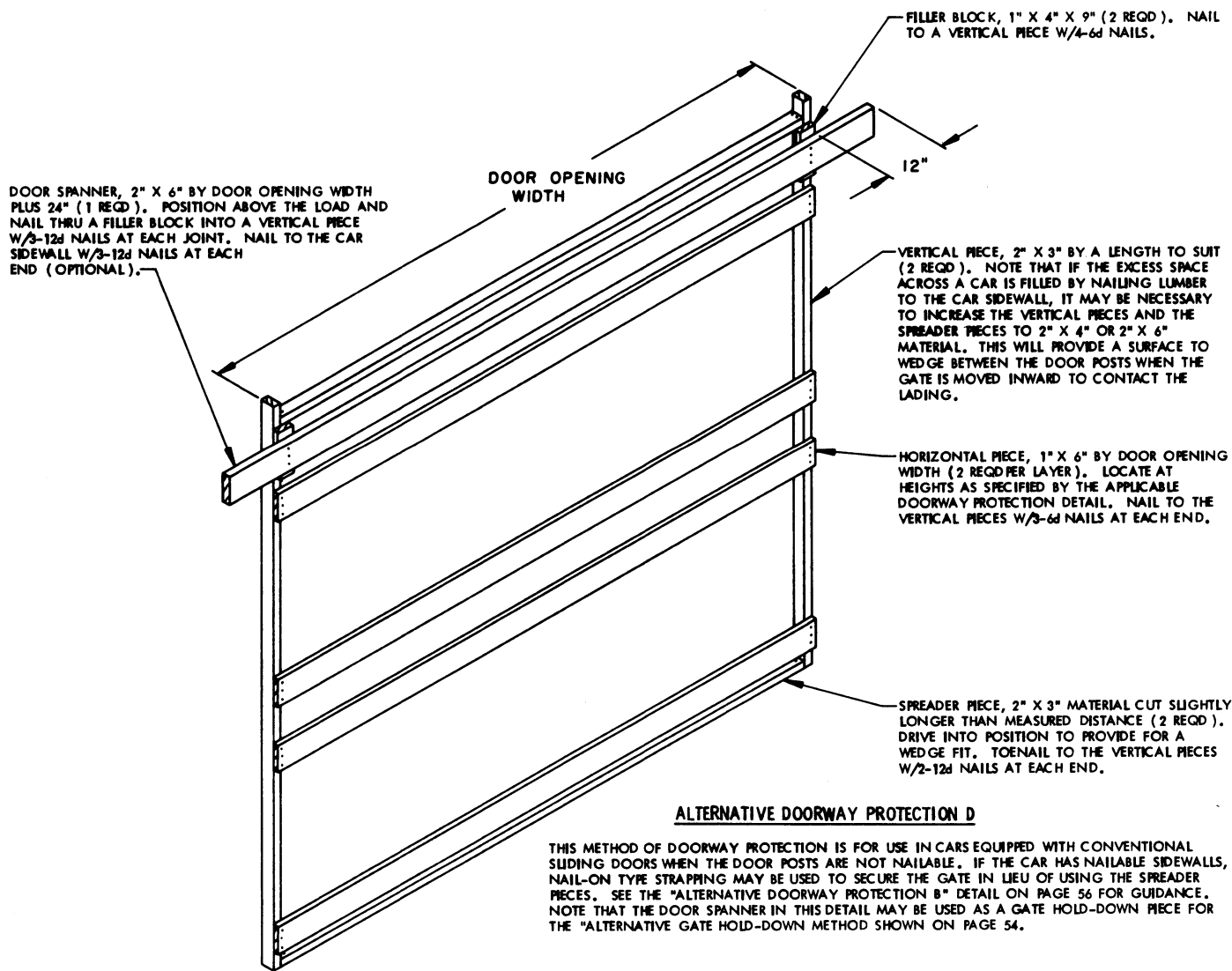
BEVEL CUTTING THE STRUTS AS SPECIFIED WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE FIT". CAUTION! DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2")

BEVEL CUT THIS CORNER ONLY IF STRUTS ARE VERY SHORT.



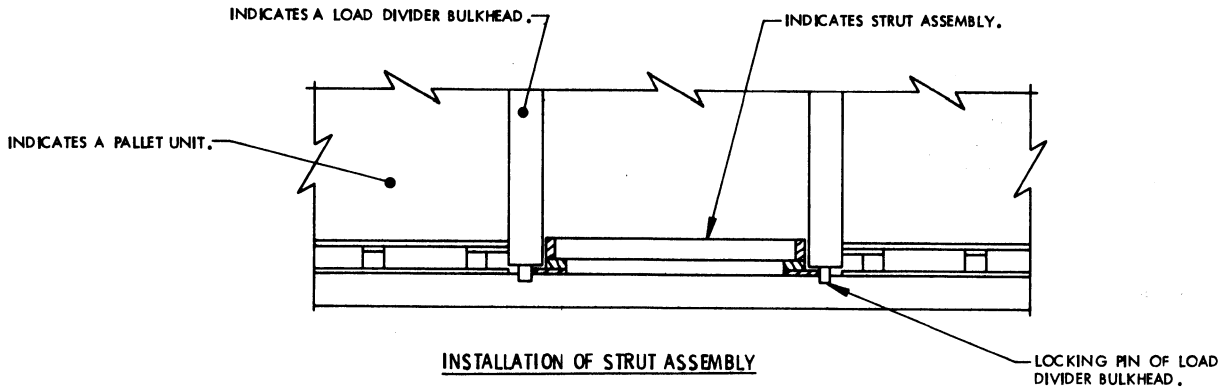
STRUT INSTALLATION

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



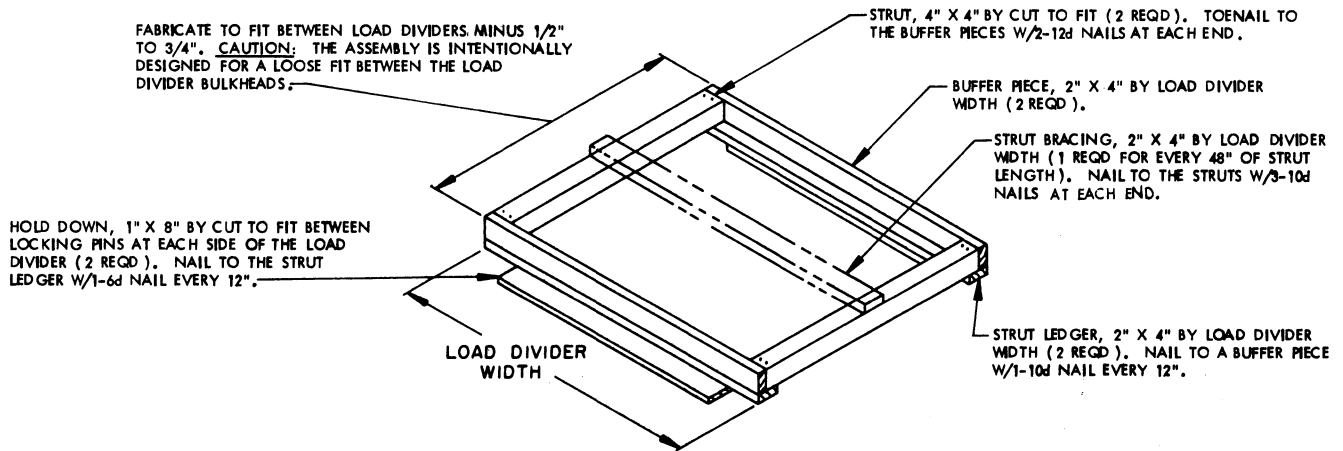
ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 56 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 54.



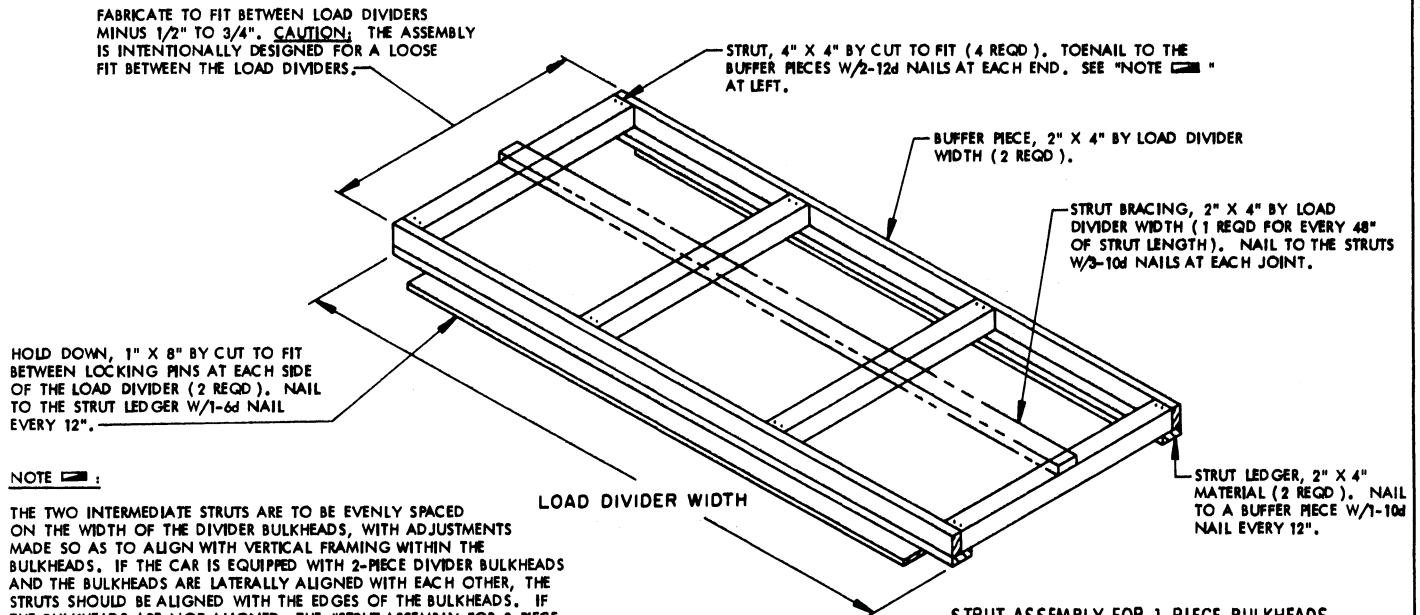
INSTALLATION OF STRUT ASSEMBLY

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

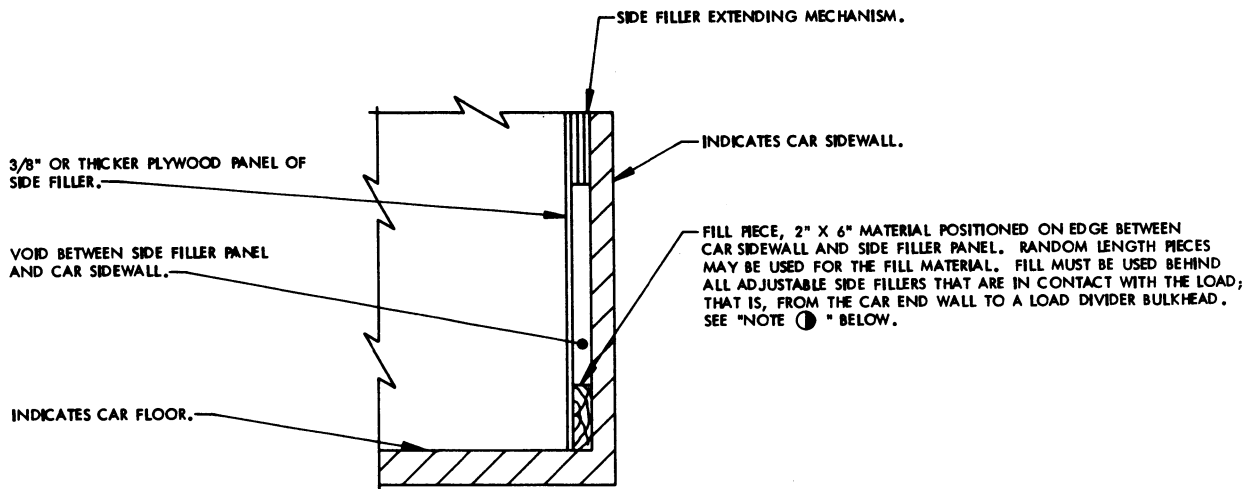


STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

NOTE []:

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

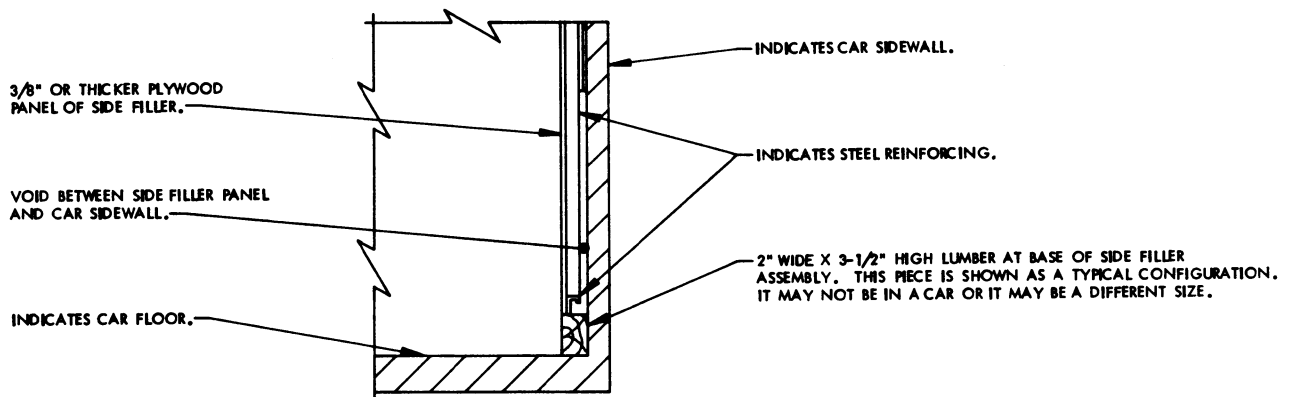


TYPICAL TYPE A

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.

