


APPROVED BY
 BUREAU OF EXPLOSIVES
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 DATE 8/19/91

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

PA100 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

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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 PA100 SERIES PROPELLING CHARGE CONTAINER WHEN UTILIZED ON A 35" X 45-1/2" FOUR WAY ENTRY PALLET. SEE THE PICTORIAL VIEWS ON PAGES 4 AND 5. REFER TO THE U.S. ARMY DARCOM (AMC) DRAWING 19-48-4042A/21-20PM1001 FOR UTILIZATION PROCEDURES FOR THE PA100 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. 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 PAGES 52 AND 54 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- E. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLETIZED UNITS OF PROPELLING CHARGE 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.
- F. 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 79 FOR GUIDANCE.
- G. 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.
- H. 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.
- J. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLETIZED 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.
- K. 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".

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MATERIAL SPECIFICATIONS

- LUMBER ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751
- NAILS ----- : COMMON, FED SPEC FF-N-105
- STRAPPING, STEEL ----- : ASTM D 3953; FLAT STRAPPING, TYPE 1 OR 2, HEAVY DUTY, COATED FINISH (ORGANIC), ZINC-COATED (GRADE 2), OR UNCOATED.
- STRAP SEAL ----- : ASTM D 3953; CLASS H, FINISH A, B (GRADE 2), OR C, TYPE D, STYLE 1,11, OR IV.
- STRAP STAPLE ----- : COMMERCIAL GRADE.
- PLYWOOD ----- : GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D, FED SPEC NN-P-530. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE SUBSTITUTED.
- WIRE ----- : FED SPEC QQ-W-461.
- HARDBOARD ----- : ANSI/AHA A 135.4, 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)

- L. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- M. 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.
- N. 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 78 FOR GUIDANCE.
- O. 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.
- P. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- Q. 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)

- R. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDE WALL 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 "L" ABOVE.
- S. NOTICE: WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDE WALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. CAUTION: WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- T. LOAD BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "TYPICAL STRUT BRACING" DETAIL ON PAGE 83. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

(CONTINUED ON PAGE 3)

(GENERAL NOTES CONTINUED)

- U. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER OF 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 83 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL-CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.
- V. 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)

- W. 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 UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT--ADJUSTABLE WALL MEMBERS TO VERTICAL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS, OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- X. 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.
- Y. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

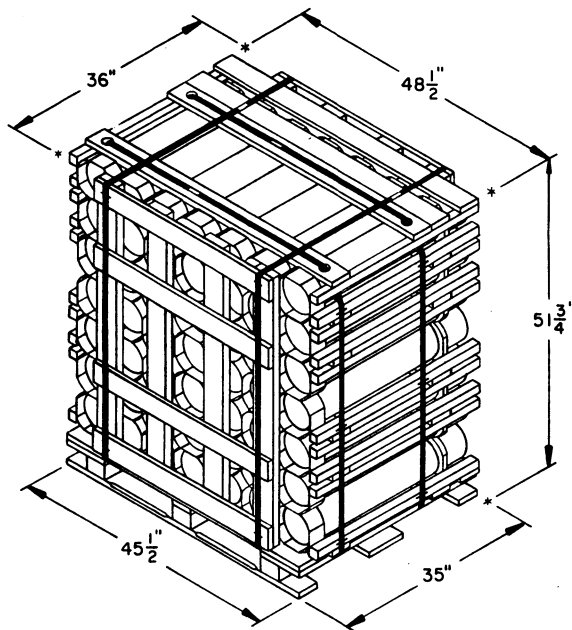
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIRCO, 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 OF THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER", WILL BE RBL, XL, OR XLI.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWN (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.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED. HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 89 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 89, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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(GENERAL NOTES CONTINUED)

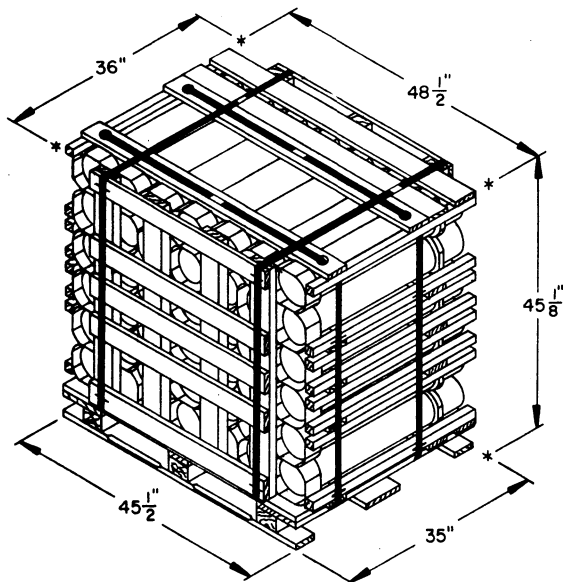
- DD. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEAD IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 88.
- FF. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLETIZED UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 60 THRU 62.
 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 56 THRU 59 FOR GUIDANCE.
 3. AT LOCATION (S) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOX CAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 74, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 70.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



BASIC HEIGHT UNIT (7-LAYER)

CONTAINER----- 49 EACH @ 26 LBS (APPROX)
 CUBE ----- 52.3 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,478 LBS (APPROX)

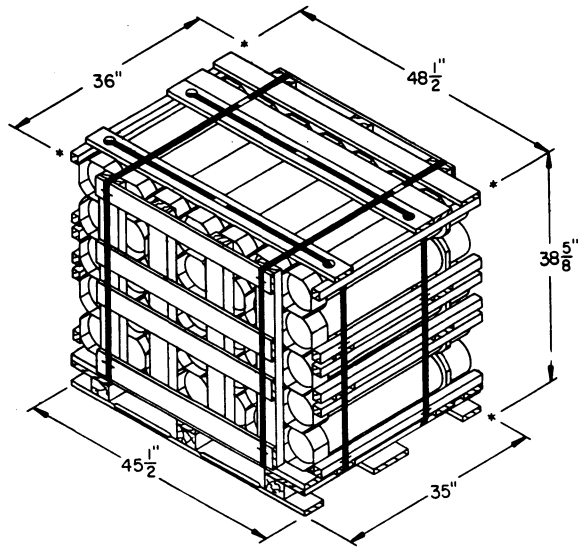
REFER TO PAGES 6 THRU 19 FOR OUTLOADING PROCEDURES



6-LAYER UNIT

CONTAINER----- 42 EACH @ 26 LBS (APPROX)
 CUBE ----- 45.6 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,272 LBS (APPROX)

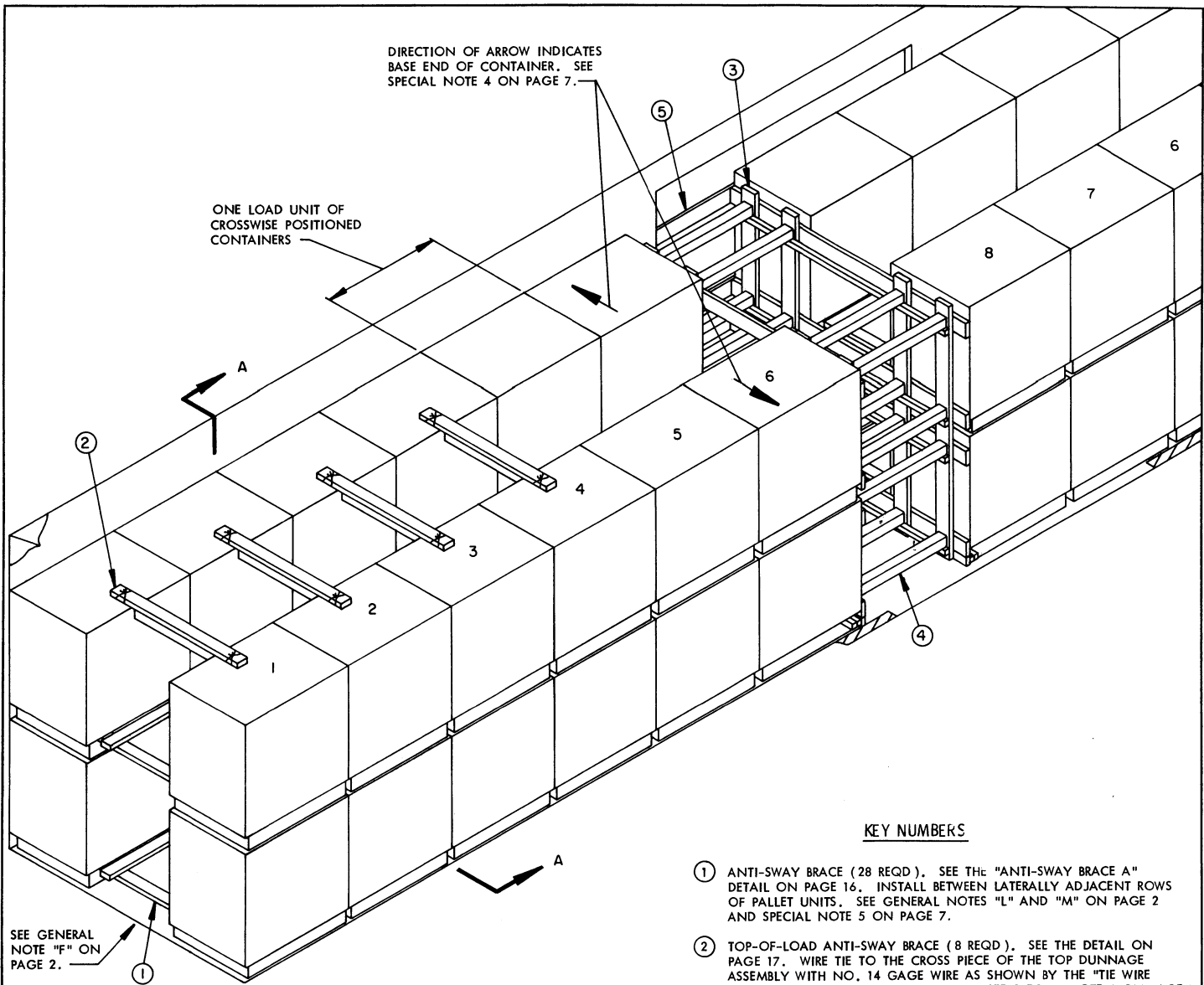
REFER TO PAGES 20 THRU 33 FOR OUTLOADING PROCEDURES



5-LAYER UNIT

CONTAINER ----- 35 EACH @ 26 LBS (APPROX)
 CUBE ----- 39.0 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,077 LBS (APPROX)

REFER TO PAGES 34 THRU 47 FOR OUTLOADING PROCEDURES.

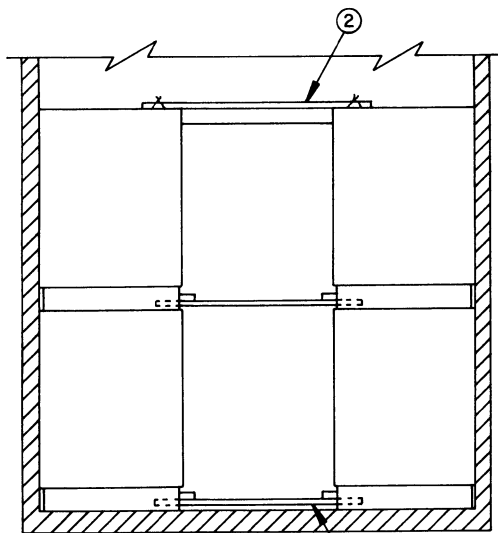


ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 6 ON PAGE 7.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 16. SEE SPECIAL NOTES 7, 8, AND 11 ON PAGE 7.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 43") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGE 2 AND/OR 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 7.

SEE GENERAL NOTE "F" ON PAGE 2.



SECTION A-A

BASIC HEIGHT UNIT (7-LAYER)
56-UNIT LOAD IN A 60'-8" LONG BY 9' 2" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

11. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECES MARKED ⑤. THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE, TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 75 AND 78 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 6. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 50'-6" CAR ----- 40 UNITS ----- 59,120 POUNDS (APPROX)
 40'-6" CAR ----- 36 UNITS ----- 53,208 POUNDS (APPROX)
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 SEVEN (7) 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. PALLET UNITS MUST BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS AGAINST THE CAR SIDEWALLS IN ORDER FOR THE VERTICAL PIECES OF "CENTER GATE A" TO BE PROPERLY ALIGNED WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. IF DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ⑤, 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 DOOR 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 10.
6. 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 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' CAR, THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' LONG CAR.
7. 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 80 FOR GUIDANCE.
8. 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 ③ IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES G" AS DETAILED ON PAGE 81. 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 80.
9. DOOR SPANNER TYPE GATE HOLD-DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 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 ⑤ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 28.

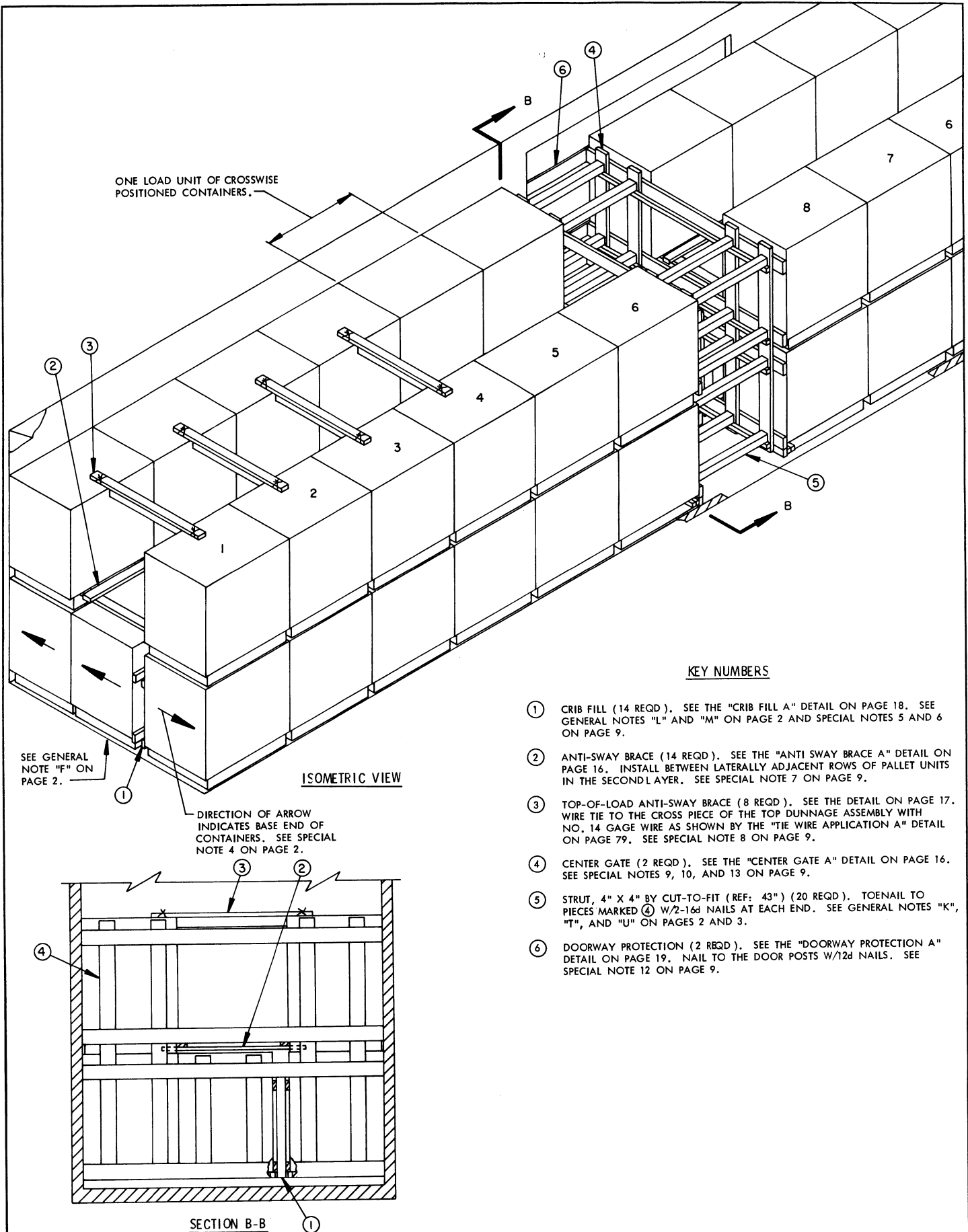
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	92	31
2" X 3"	33	17
2" X 4"	481	321
2" X 6"	142	142
4" X 4"	58	78
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	560	8-3/4
12d (3-1/4")	80	1-1/2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE-----48' REQD-----1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	56	82,768 LBS
DUNNAGE-----		1,272 LBS
TOTAL WEIGHT-----		84,040 LBS

BASIC HEIGHT UNIT (7-LAYER)
 56-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



KEY NUMBERS

- ① CRIB FILL (14 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 18. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTES 5 AND 6 ON PAGE 9.
- ② ANTI-SWAY BRACE (14 REQD). SEE THE "ANTI SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS IN THE SECOND LAYER. SEE SPECIAL NOTE 7 ON PAGE 9.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 8 ON PAGE 9.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 16. SEE SPECIAL NOTES 9, 10, AND 13 ON PAGE 9.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 43") (20 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 12 ON PAGE 9.

BASIC HEIGHT UNIT (7-LAYER)
 70-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

11. DOOR SPANNER TYPE GATE HOLD-DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 FOR GUIDANCE.
12. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ④ IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 28.
13. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECES MARKED ④, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING. IF THE CENTER ROW IS STACKED 2-HIGH, THE VERTICAL PIECES OF THE CENTER GATE ADJACENT TO THE ANTI-SWAY BRACE MUST BE WIRE TIED TO THE RETAINER PIECE OF THE ANTI-SWAY BRACE TO PREVENT DISPLACEMENT OF THE CENTER GATE. IN A CAR EQUIPPED WITH SLIDING DOORS IN LIEU OF USING THE 2" X 6" X 12" PIECES.
14. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FIVE (5) PALLET 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, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78.
15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 75 AND 78 FOR GUIDANCE..
16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 8. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:

50'-6" CAR -----60 UNITS-----88,680 LBS (APPROX)
40'-6" CAR -----45 UNITS----- 66,510 LBS (APPROX)

IF THE CAR IS LOADED 2-HIGH IN THE CENTER ROW THE FOLLOWING APPLIES:

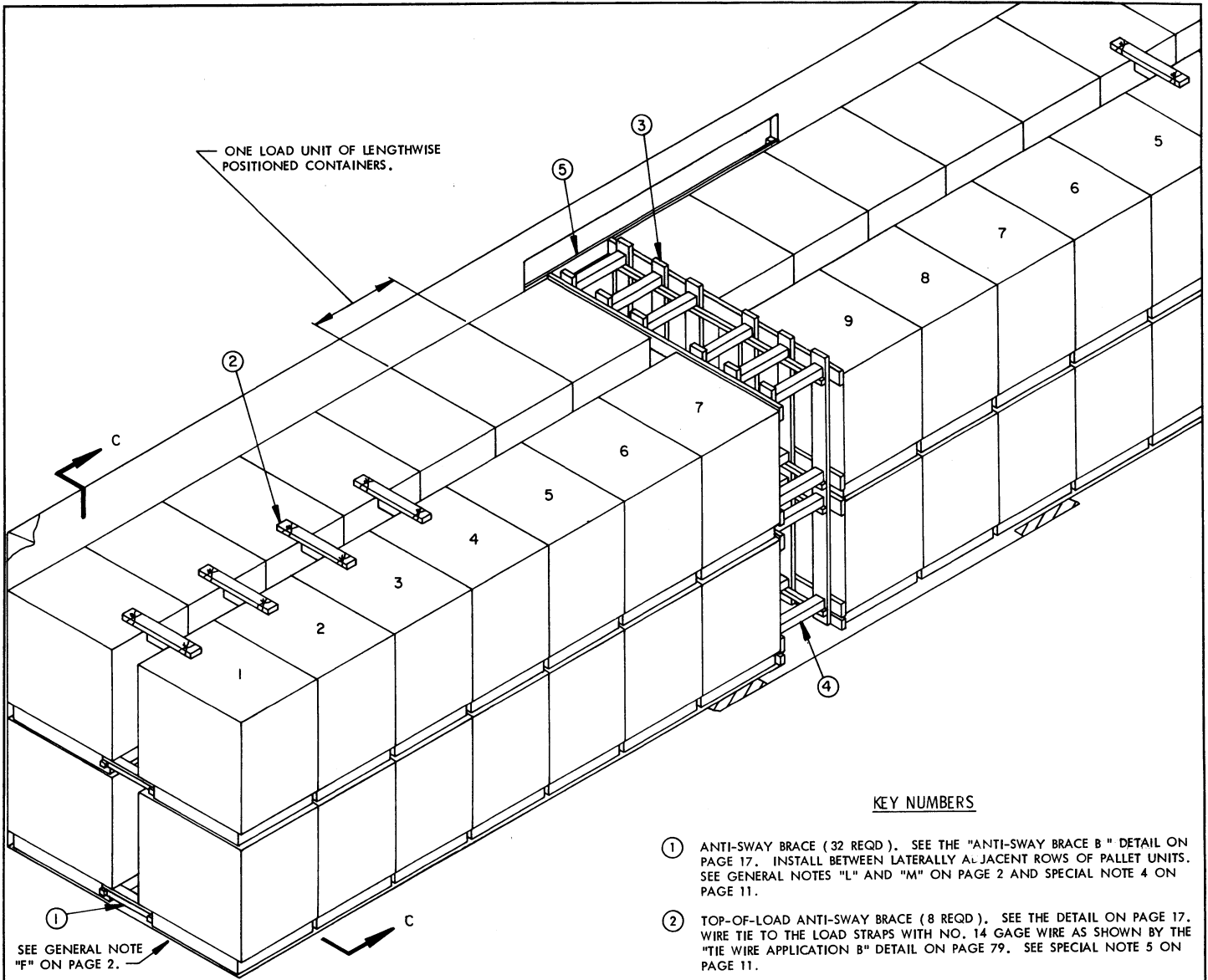
60'-8" CAR -----84 UNITS-----124,152 LBS (APPROX)
50'-6" CAR -----72 UNITS-----106,416 LBS (APPROX)
40'-6" CAR -----54 UNITS----- 79,812 LBS (APPROX)
3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND 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 SEVEN (7) 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. PALLET UNITS MUST BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS POSITIONED AS SHOWN BY THE DIRECTION OF THE ARROWS IN THE LOAD ON PAGE 8. THIS ARRANGEMENT WILL PROPERLY ALIGN THE VERTICAL PIECES OF CENTER GATE "A" WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. CRIB FILL, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 8, MUST BE INSTALLED. IF THE CENTER ROW OF PALLET UNITS IS ALSO LOADED 2-HIGH, FOUR (4) "CRIB FILL A" ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD REGARDLESS OF CAR LENGTH. "CRIB FILL B", AS DETAILED ON PAGE 18, WILL BE USED FOR THE REMAINDER OF UNITS IN A 2-HIGH LOAD. IF A CAR IS LESS THAN 9'-4" WIDE, CRIB FILL WILL NOT BE REQUIRED. NOTE THAT AN EXCESS SPACE ACROSS THE CAR MAY BE FILLED BY NAILING MATERIAL TO THE CAR SIDEWALL ON ONE OR BOTH SIDES AT THE SAME HEIGHTS AS SHOWN FOR THE DOORWAY PROTECTION GATES, PIECE MARKED ⑥. ADJUST THE WIDTH OF THE CENTER GATES AS NECESSARY.
6. IF DOORWAY PROTECTION PROCEDURES AS SHOWN IN THE LOAD ON PAGE 28 ARE USED IN LIEU OF WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ④, NAILED FLOORLINE BLOCKING MUST BE USED. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE STACK WIDTH. NOTE THAT THE VERTICAL PIECES OF THE CRIB FILL, PIECE MARKED ①, WHICH IS IN THE DOORWAY MUST HAVE THREE INCHES (3") CUT OFF THE BOTTOM END WHERE IT RESTS ON THE NAILED FLOORLINE BLOCKING.
7. ANTI-SWAY BRACES, SHOWN AS PIECE MARKED ②, MUST BE INSTALLED BETWEEN ALL OF THE TOP TIER PALLET UNITS AS SHOWN ON PAGE 8.
8. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 8, 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 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60' CAR, THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' LONG CAR.
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 80 FOR GUIDANCE.
10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED ④ IN THE LOAD ON PAGE 8, INSTALL THREE (3) "CENTER GATES G" AS DETAILED ON PAGE 81. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER. FOR ADDITIONAL INSTALLATION PROCEDURES AND "TIE PIECE APPLICATION DETAIL", REFER TO PAGE 80.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	94	32
2" X 3"	138	69
2" X 4"	518	346
2" X 6"	162	162
4" X 4"	72	96
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	656	10-1/4
12d (3-1/4")	80	1-1/2
16d (3-1/2")	80	1-3/4
WIRE, NO. 14 GAGE-----	48' REQD-----	1 LB

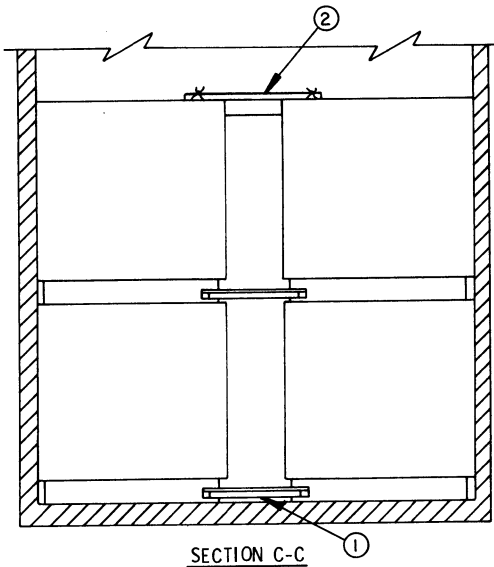
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LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	70-----	103,460 LBS
DUNNAGE-----	-----	1,505 LBS
TOTAL WEIGHT-----	-----	104,965 LBS

BASIC HEIGHT UNIT (7-LAYER)
70-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR



ISOMETRIC VIEW



KEY NUMBERS

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 11.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 5 ON PAGE 11.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 17, AND SPECIAL NOTES 6, 7, AND 8 ON PAGE 11.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 24") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 19. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 11.

BASIC HEIGHT UNIT (7-LAYER)
64-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 10. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 60'-8" CAR ----- 76 UNITS -----112,328 LBS (APPROX)
 40'-6" CAR -----48 UNITS ----- 70,944 LBS (APPROX)
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 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 DOORWAY PROTECTION PROCEDURES AS SHOWN IN THE LOAD ON PAGE 14 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), 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.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (2) IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. FOUR BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' 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 80 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 B" SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 10, INSTALL TWO (2) "CENTER GATES H" AS DETAILED ON PAGE 82. 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 80.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATES "B", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 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 LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 10 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 14.
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 50 THRU 78 FOR GUIDANCE.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 76 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	104	35
1" X 6"	80	40
2" X 2"	261	87
2" X 3"	40	20
2" X 4"	140	94
2" X 6"	181	181
4" X 4"	48	64
NAILS	NO. REQD	POUNDS
6d (2")	560	3-1/2
10d (3")	560	8-3/4
12d (3-1/4")	56	1
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		


LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	64 -----	94,592 LBS
DUNNAGE -----	-----	1,059 LBS
TOTAL WEIGHT-----		95,651 LBS

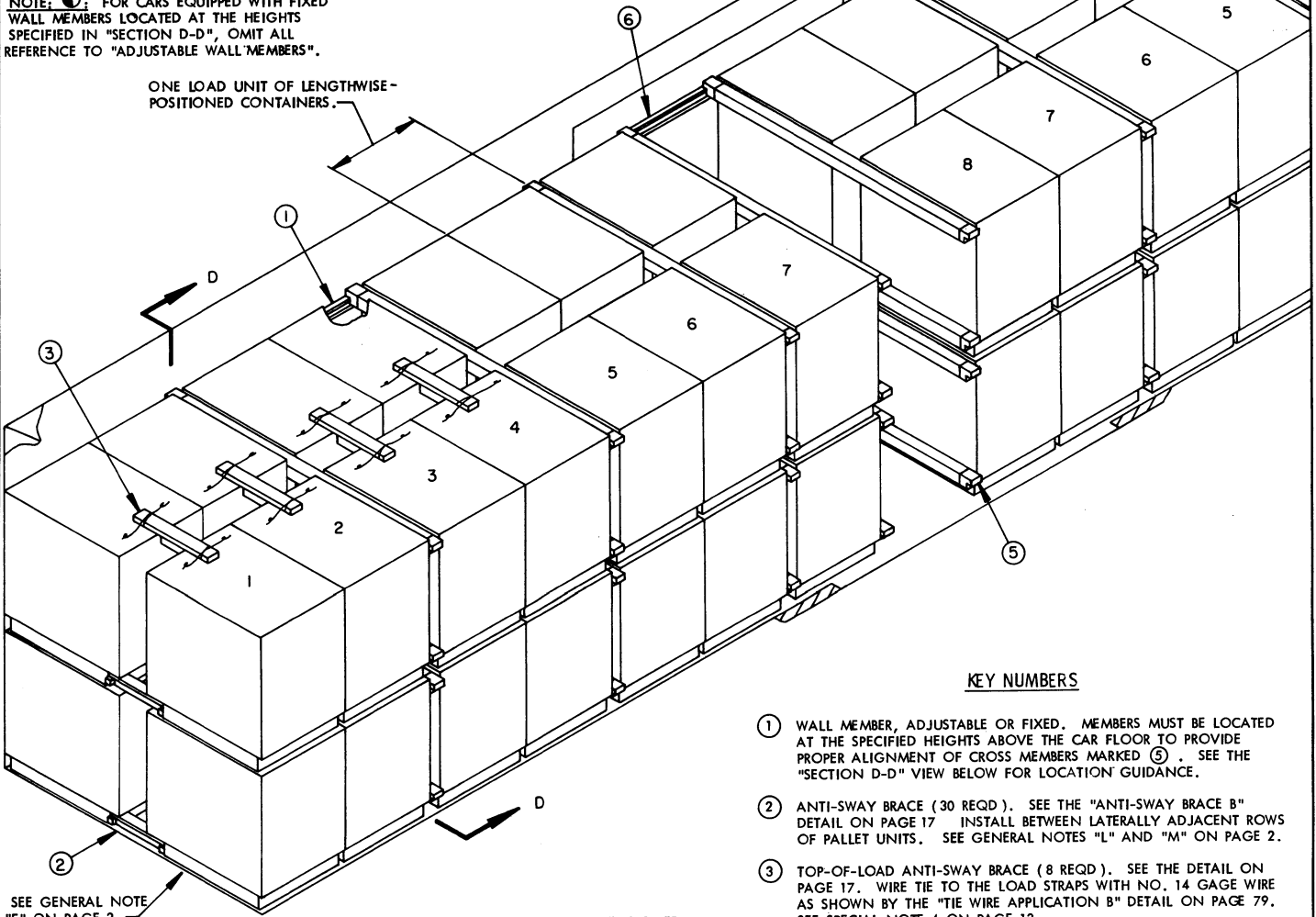
BASIC HEIGHT UNIT (7-LAYER)
 64-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

CAR EQUIPMENT REQUIRED



ADJUSTABLE WALL MEMBER (SEE "NOTE" BELOW)	48
CROSS MEMBERS	32
DOORWAY MEMBERS	8

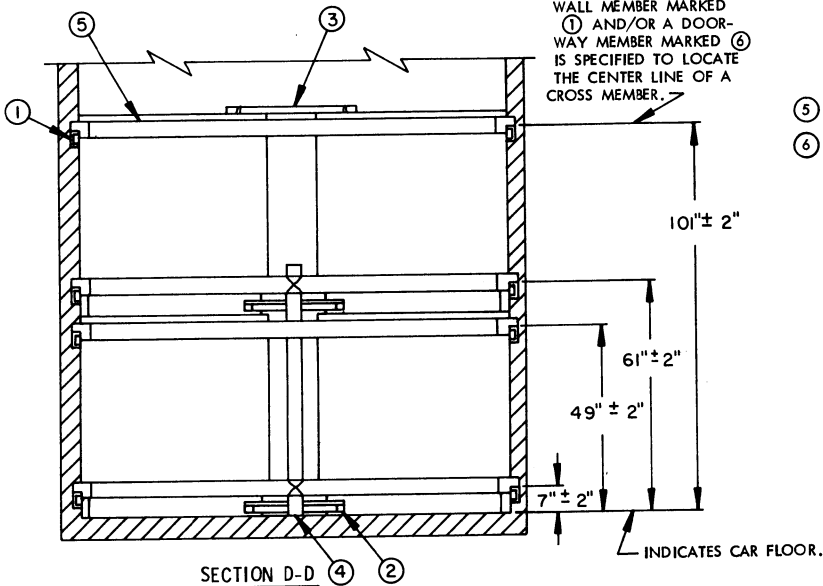
NOTE:  FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION D-D", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



ONE LOAD UNIT OF LENGTHWISE-
POSITIONED CONTAINERS.











ISOMETRIC VIEW

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



SECTION D-D  

KEY NUMBERS

-  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 . SEE THE "SECTION D-D" VIEW BELOW FOR LOCATION GUIDANCE.
-  ANTI-SWAY BRACE (30 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
-  TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 4 ON PAGE 13.
-  STOP PIECE, 1" X 4" X 64" (14 REQD). INSTALL AT EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION TO PREVENT DISPLACEMENT OF ANTI-SWAY BRACES, PIECE MARKED . NAIL TO THE CROSS BRACE OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON NEAR SIDE OF CROSS MEMBERS, WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE. SEE SPECIAL NOTE 5 ON PAGE 13.
-  CROSS MEMBER (32 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
-  DOORWAY MEMBER (8 REQD). SEE THE "SECTION D-D" VIEW AT LEFT FOR LOCATION GUIDANCE.

BASIC HEIGHT UNIT (7-LAYER)

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

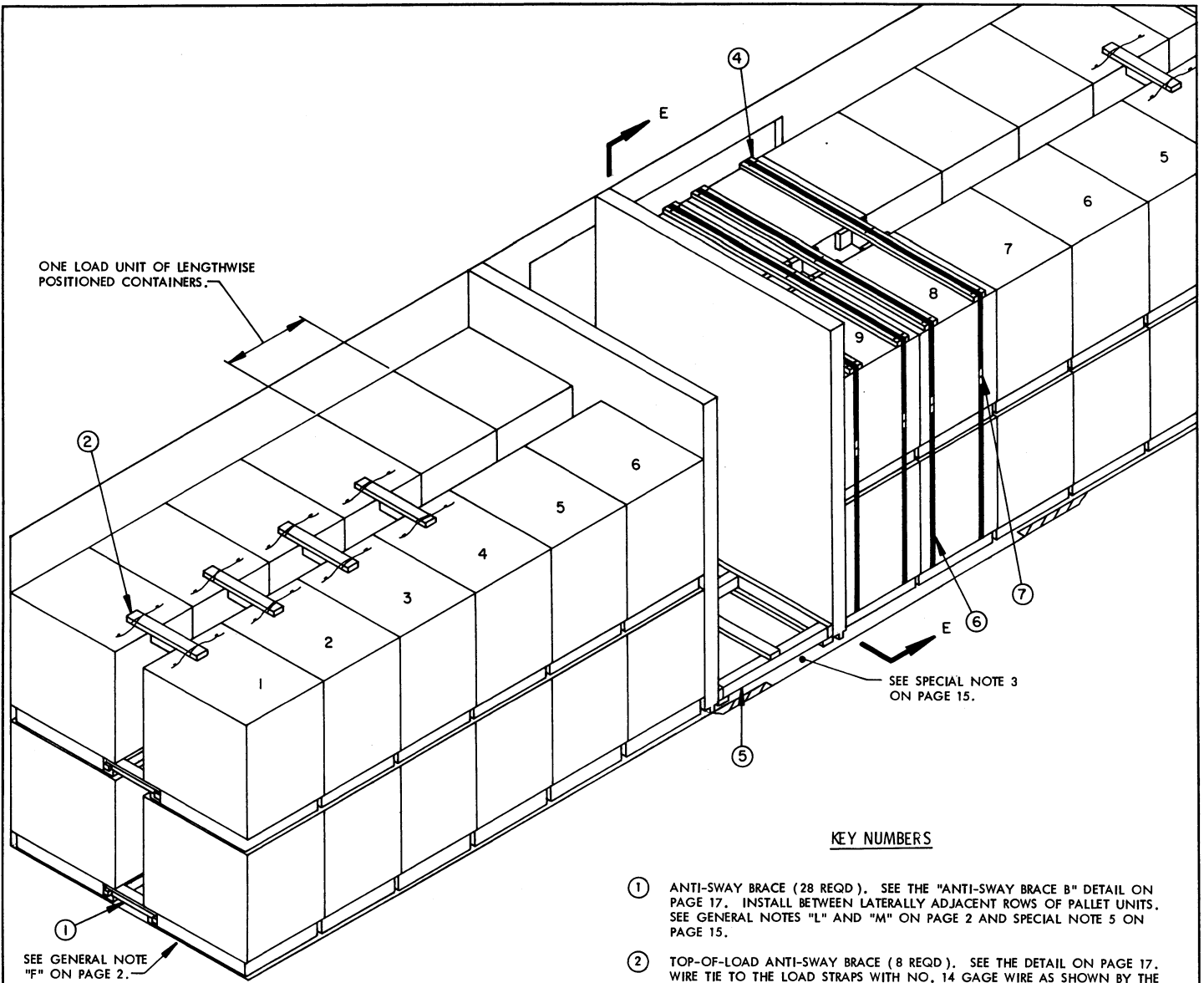
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) 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.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 12. A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 70,944 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 "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
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 LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. A STOP PIECE, PIECE MARKED ④, IS REQUIRED ON EACH LOAD SIDE OF A CROSS MEMBER TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE.
6. 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 48 AND 49 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

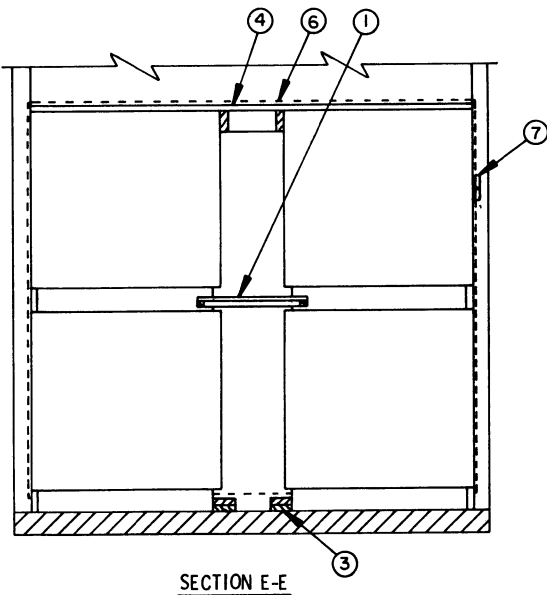
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	163	55
2" X 2"	179	60
2" X 4"	100	67
NAILS	NO. REQD	POUNDS
6d (2")	512	3-1/4
10d (3")	240	3-3/4
12d (3-1/4")	24	1/2
WIRE, NO. 14 GAGE-----144' REQD-----2-1/2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	60	88,680 LBS
DUNNAGE		374 LBS
TOTAL WEIGHT		89,054 LBS



ISOMETRIC VIEW



KEY NUMBERS

- ① ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 15.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 4 ON PAGE 15.
- ③ SIDE BLOCKING, 2" X 6" X 36" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING ONE OR TWO BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 15.
- ④ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 18. SEE SPECIAL NOTE 6 ON PAGE 15.
- ⑤ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 88. SEE GENERAL NOTE "EE" ON PAGE 3.
- ⑥ DOORWAY PROTECTION BUNDLING STRAP, 1-1/4" X .035" OR .031" X 36'-0" LONG STEEL STRAPPING (4 REQD). INSTALL AS SHOWN TO ENCIRCLE LOAD UNIT IN DOORWAY. STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 15.
- ⑦ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.

BASIC HEIGHT UNIT (7-LAYER)

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 14. USE THE CHART BELOW TO DETERMINE OTHER MAXIMUM LOADS, AS APPLICABLE. SEE SPECIAL NOTE 8.

CAR LENGTH	POSITION OF CONTAINERS	NO. OF UNITS	APPROXIMATE LADING WEIGHT
60'-8"	LENGTHWISE	76	112,328 LBS
40'-6"	LENGTHWISE	48	70,944 LBS
60'-8"	CROSSWISE (2-WIDE)	56	82,768 LBS
50'-6"	CROSSWISE (2-WIDE)	48	70,944 LBS
40'-6"	CROSSWISE (2-WIDE)	36	53,208 LBS
60'-8"	CROSSWISE (3-WIDE)	84	124,152 LBS
50'-6"	CROSSWISE (3-WIDE)	72	106,416 LBS
40'-6"	CROSSWISE (3-WIDE)	54	79,812 LBS
3. NOTE THAT ONE LOAD UNIT MAY BE ADDED TO THE LOAD ON PAGE 14 IF THE OPERATING MECHANISM IS LOCATED ON THE OUTSIDE EDGE OF THE BULKHEAD.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 14, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. 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 60' CARS.
5. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED ⑤ ON PAGE 10 FOR CONTAINERS-LENGTHWISE LOADS OR PIECE MARKED ⑥ ON PAGE 8 FOR CONTAINERS-CROSSWISE LOADS, MAY BE USED IN LIEU OF THE SPACER ASSEMBLIES, DOORWAY PROTECTION STRAPS AND SEALS, PIECES MARKED ④, ⑥, AND ⑦. ANTI-SWAY BRACES MAY ALSO BE USED IN LIEU OF THE SIDE BLOCKING, PIECE MARKED ③.
6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH OR WIDTH. THE DEPICTED DOORWAY PROTECTION MAY BE USED WHETHER THE CAR IS EQUIPPED WITH SLIDING DOORS OR WITH PLUG DOORS, HOWEVER, IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, THE NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 14. FOR CROSSWISE POSITIONED CONTAINERS, REFER TO PAGE 28 FOR GUIDANCE. NOTE: TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM SIX INCHES (6") TO ONE-HALF THE PALLET UNIT LENGTH OR WIDTH.
7. A STRUT ASSEMBLY IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.
8. IF THE PALLET UNITS ARE TO BE POSITIONED IN THE CAR WITH THE CONTAINERS CROSSWISE, THE LATERAL BRACING OF THE PALLET UNITS WILL VARY FROM THAT SHOWN ON PAGE 14. FOR A 2-WIDE LOAD OF CROSSWISE POSITIONED CONTAINERS REFER TO PAGE 6 FOR LOADING GUIDANCE; IF A FULL OR PARTIAL 3-WIDE LOAD IS TO BE SHIPPED REFER TO PAGE 8 FOR GUIDANCE.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 52 THRU 59 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 75, 76, OR 78, AS APPLICABLE, FOR GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	91	31
1" X 8"	17	12
2" X 2"	167	56
2" X 4"	152	102
2" X 6"	72	72
4" X 4"	17	23
NAILS	NO. REQD	POUNDS
6d (2")	464	2-3/4
10d (3")	242	3-3/4
12d (3-1/4")	88	1-1/2
16d (3-1/2")	40	1-1/4
WIRE, NO. 14 GAGE-----80' REQD ---1-1/2 LBS		
STEEL STRAPPING, 1-1/4" X .035" OR .031"---146' REQD ---21 LBS		
STAPLE FOR 1-1/4" STRAPPING-----12 REQD ---NIL		

LOAD AS SHOWN

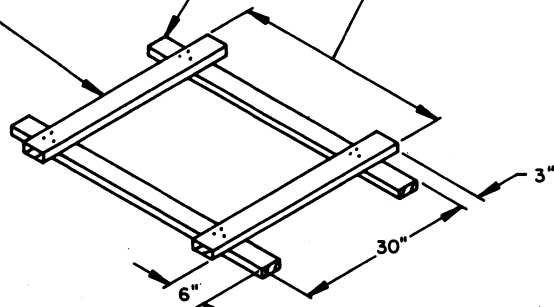
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	60	88,680 LBS
DUNNAGE-----		624 LBS
TOTAL WEIGHT-----		89,304 LBS

BASIC HEIGHT UNIT (7-LAYER)
60-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

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

BUFFER PIECE, 2" X 4" X 36" (2 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

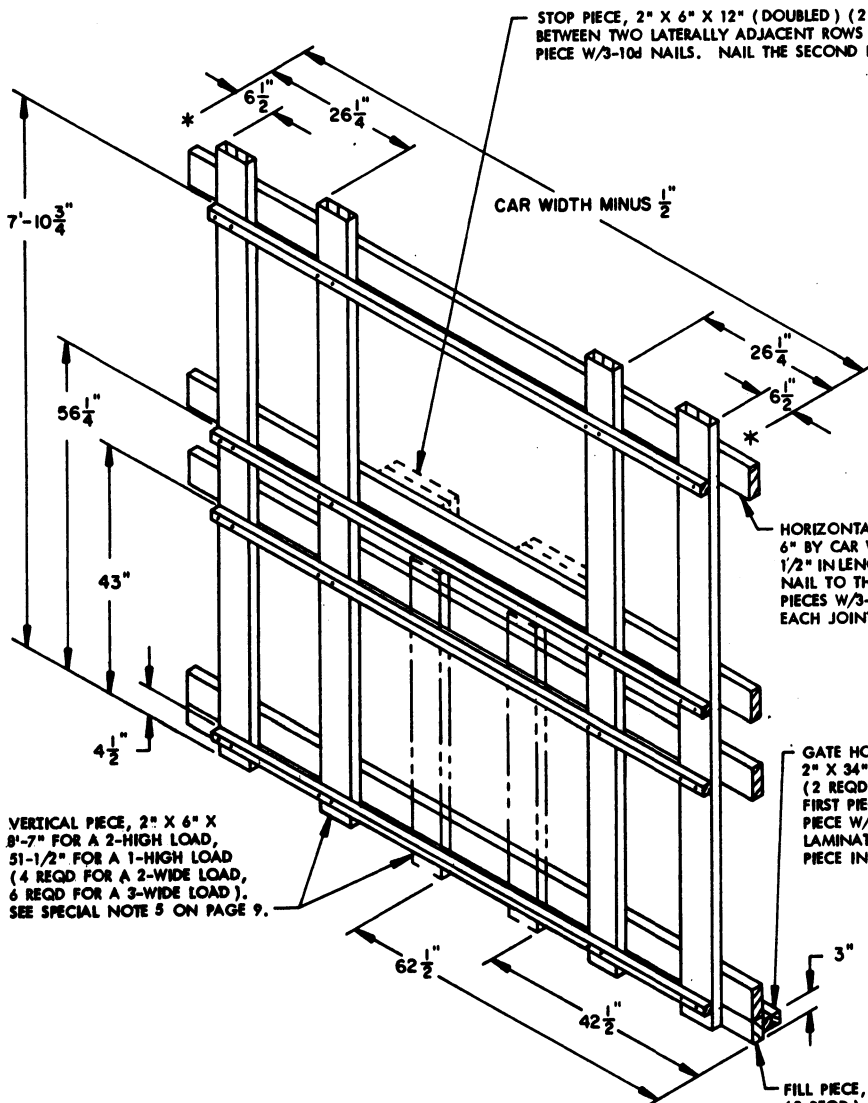
FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT PALLETS.



ANTI-SWAY BRACE A

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

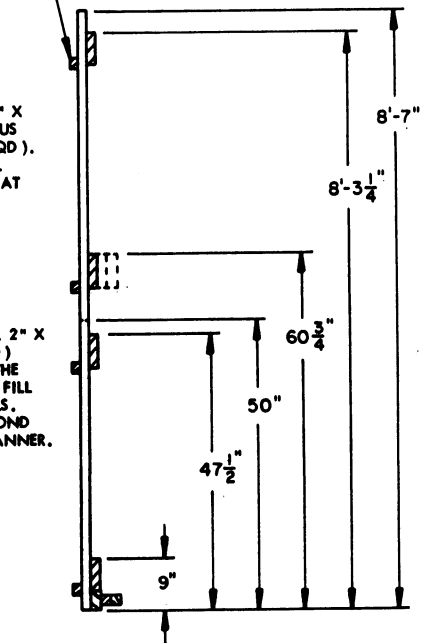
STOP PIECE, 2" X 6" X 12" (DOUBLED) (2 REQD). POSITION ONE PIECE ON EACH SIDE OF THE VOID BETWEEN TWO LATERALLY ADJACENT ROWS OF PALLET UNITS. NAIL THE FIRST PIECE TO THE HORIZONTAL PIECE W/3-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.



CENTER GATE A

THIS GATE IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 8. NOTE THAT LEFT HAND AND RIGHT HAND GATES ARE REQUIRED FOR THE LOAD ON PAGE 8.

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



END VIEW

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

GATE HOLD DOWN, 2" X 2" X 34" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FILL PIECE W/5-10d NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER.

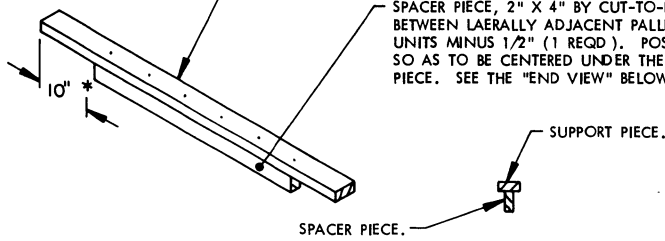
VERTICAL PIECE, 2" X 6" X 8'-7" FOR A 2-HIGH LOAD, 51-1/2" FOR A 1-HIGH LOAD (4 REQD FOR A 2-WIDE LOAD, 6 REQD FOR A 3-WIDE LOAD). SEE SPECIAL NOTE 5 ON PAGE 9.

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

DETAILS FOR BASIC HEIGHT UNIT (7-LAYER)

SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE SPACER PIECE W/6-12d NAILS FOR CONTAINERS CROSSWISE LOADS, OR W/3-12d NAILS FOR CONTAINERS LENGTHWISE LOADS.

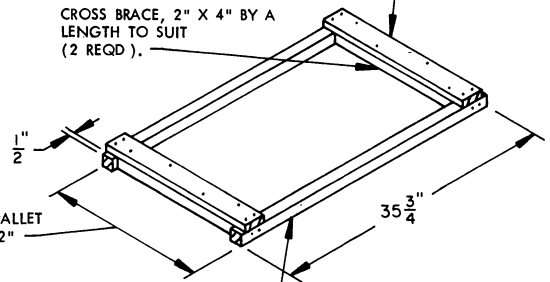
SPACER PIECE, 2" X 4" BY CUT-TO-FIT BETWEEN LAERALLY ADJACENT PALLET UNITS MINUS 1/2" (1 REQD). POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE. SEE THE "END VIEW" BELOW.



TOP-OF-LOAD ANTI-SWAY BRACE

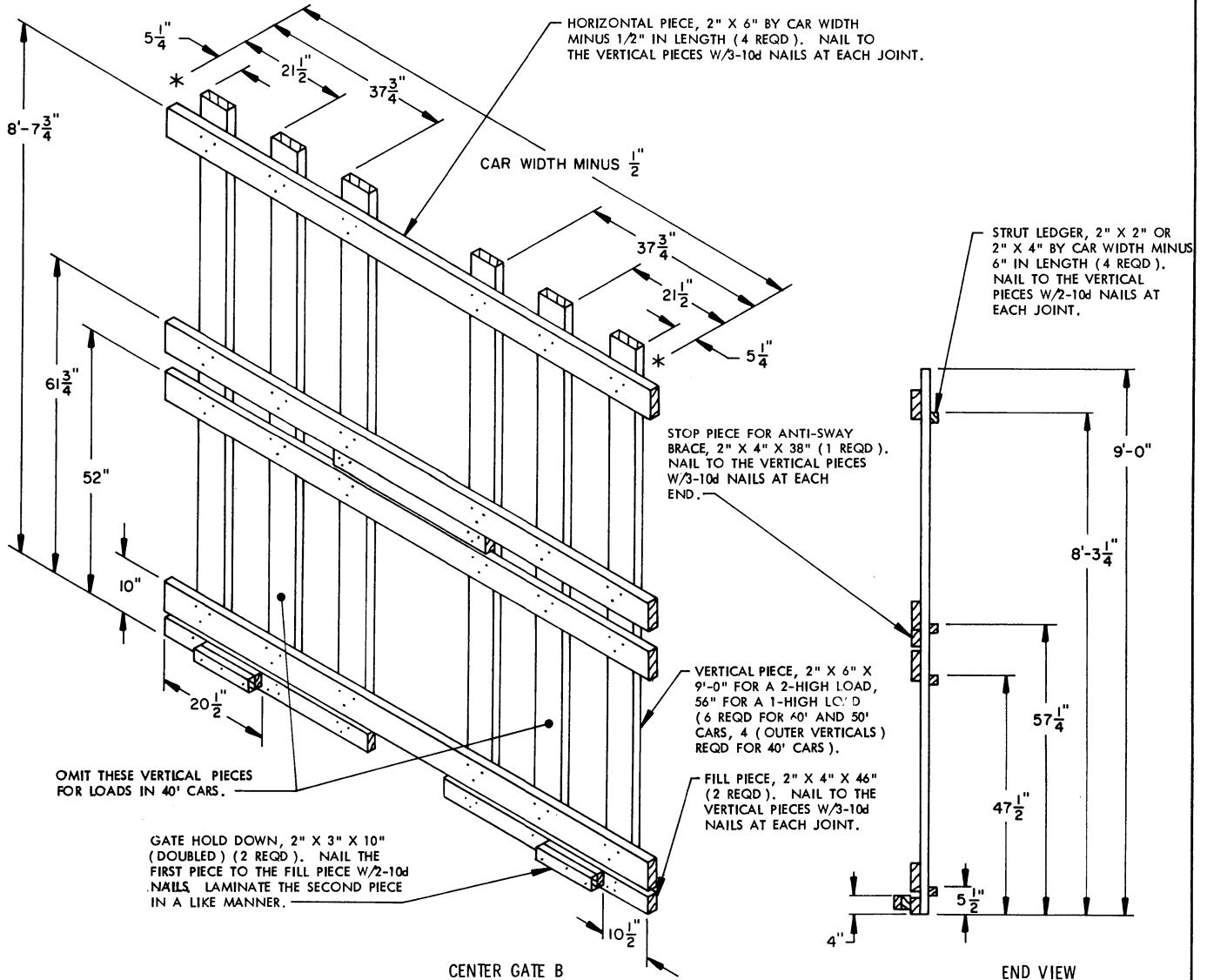
CLEAT, 1" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE LONGITUDINAL PIECES W/2-6d NAILS AT EACH END AND TO A CROSS BRACE W/4-6d NAILS.

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



LONGITUDINAL PIECE, 2" X 2" X 35-3/4" (2 REQD). NAIL TO THE CROSS BRACES W/2-10d NAILS AT EACH JOINT.

ANTI-SWAY BRACE B



CENTER GATE B

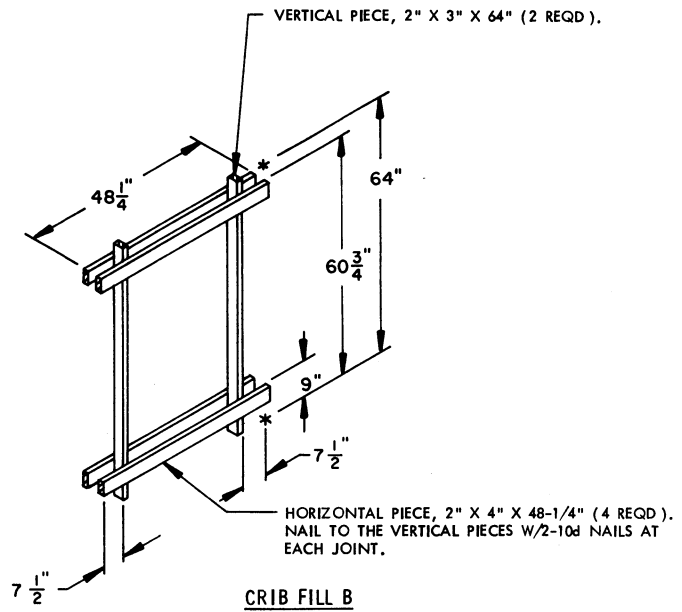
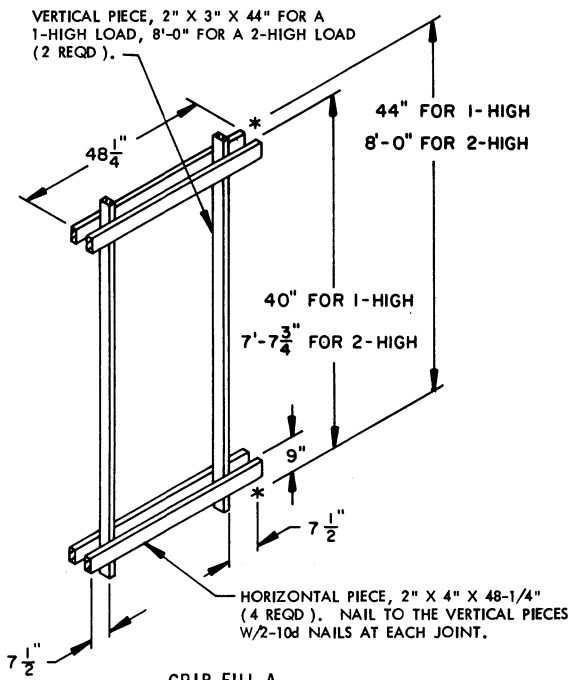
END VIEW

OMIT THESE VERTICAL PIECES FOR LOADS IN 40' CARS.

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

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 10.

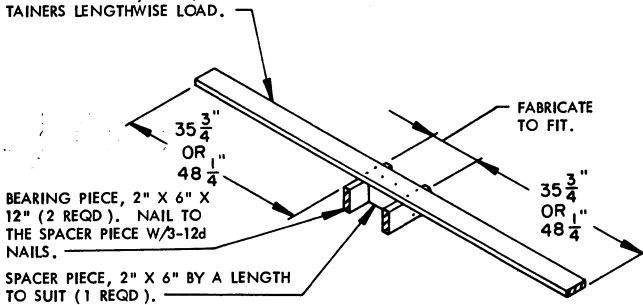
DETAILS FOR BASIC HEIGHT UNIT (7-LAYER)



CRIB FILL "B" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "A" THROUGHOUT THE LENGTH OF THE LOAD.

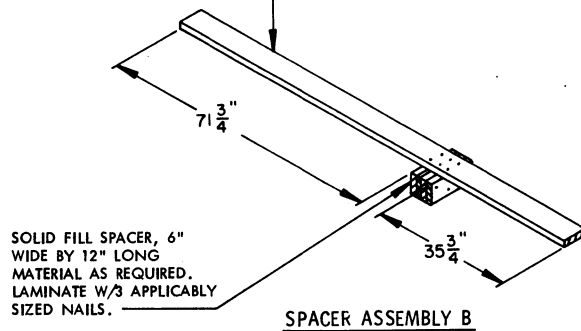
CRIB FILL ASSEMBLIES "A" AND "B" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

STRAPPING BOARD, 2" X 6" BY CAR WIDTH MINUS 1/2" (1 REQD.). NAIL TO THE BEARING PIECES W/2-12d NAILS AT EACH JOINT. NAIL TO THE SPACER PIECE W/5-12d NAILS FOR CONTAINERS CROSSWISE LOAD, OR W/2-12d NAILS FOR CONTAINERS LENGTHWISE LOAD.



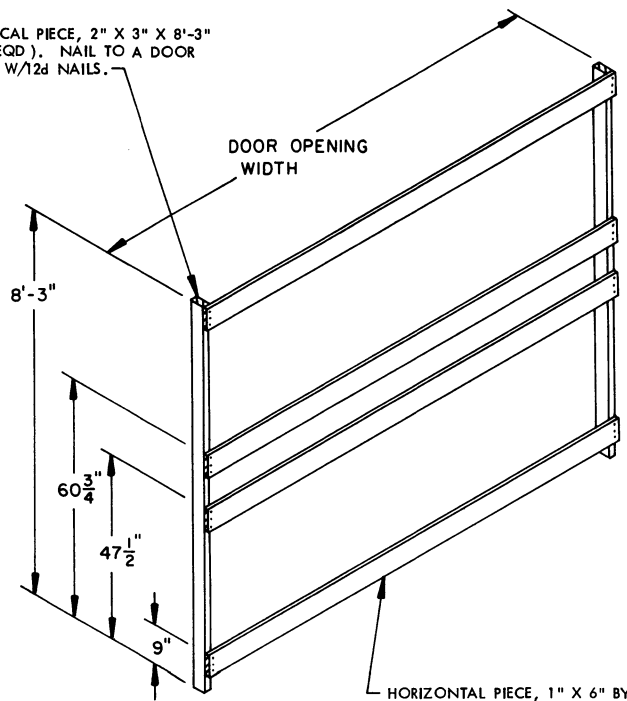
THIS ASSEMBLY IS FOR USE WHEN THE TOP LAYER IN THE DOORWAY IS TWO UNITS WIDE, EITHER LENGTHWISE OR CROSSWISE.

STRAPPING BOARD, 2" X 6" BY CAR WIDTH MINUS 1/2" (1 REQD.). NAIL TO THE SOLID FILL SPACER W/6-12d NAILS.



THIS ASSEMBLY IS FOR USE WHEN THE TOP LAYER IN THE DOORWAY IS THREE UNITS WIDE.

VERTICAL PIECE, 2" X 3" X 8'-3"
(2 REQD). NAIL TO A DOOR
POST W/12d NAILS.



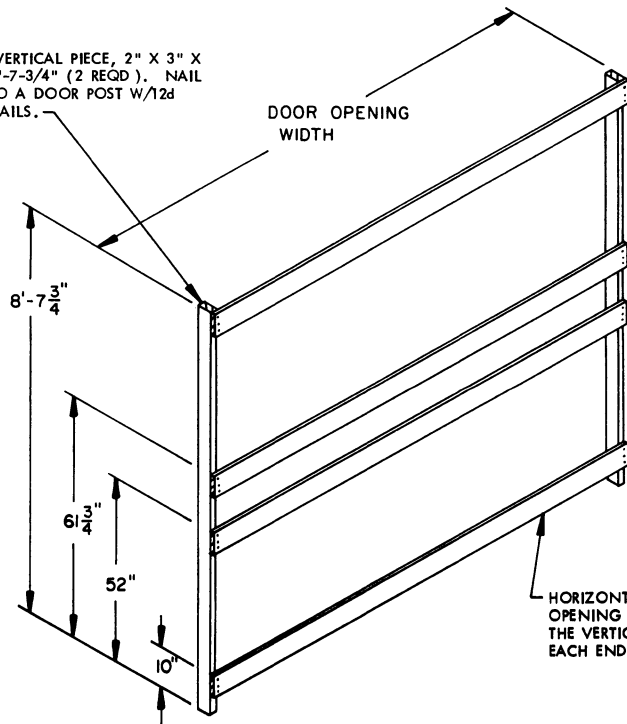
DOOR OPENING
WIDTH

HORIZONTAL PIECE, 1" X 6" BY DOOR
OPENING WIDTH (4 REQD). NAIL TO
THE VERTICAL PIECES W/3-6d NAILS AT
EACH END.

DOORWAY PROTECTION B

THIS ASSEMBLY IS FOR USE IN THE LOAD SHOWN
ON PAGE 10.

VERTICAL PIECE, 2" X 3" X
8'-7-3/4" (2 REQD). NAIL
TO A DOOR POST W/12d
NAILS.



DOOR OPENING
WIDTH

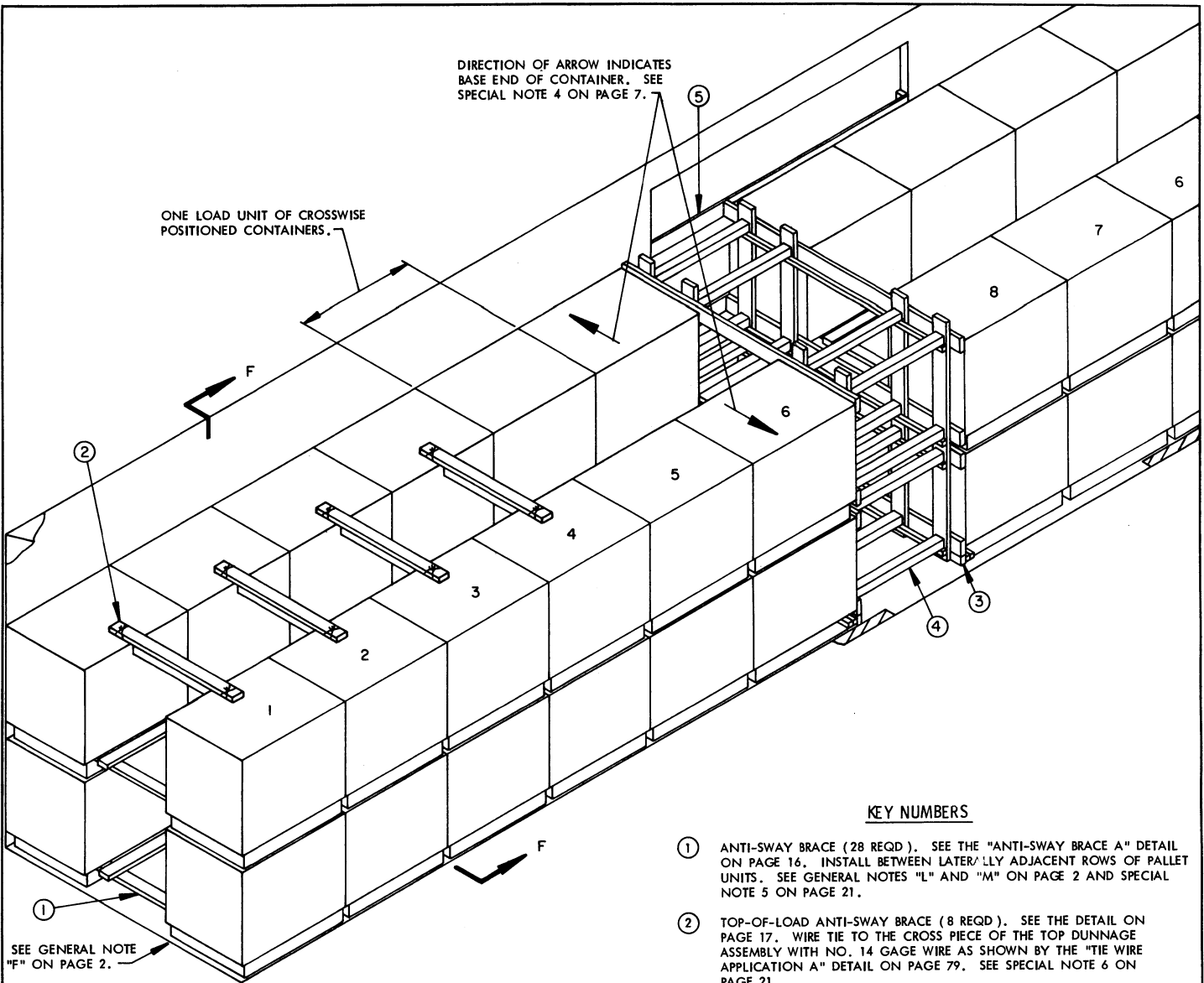
HORIZONTAL PIECE, 1" X 6" BY DOOR
OPENING WIDTH (4 REQD). NAIL TO
THE VERTICAL PIECES W/3-6d NAILS AT
EACH END.

DOORWAY PROTECTION A

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN
ON PAGES 6 AND 8.

DIRECTION OF ARROW INDICATES
BASE END OF CONTAINER. SEE
SPECIAL NOTE 4 ON PAGE 7.

ONE LOAD UNIT OF CROSSWISE
POSITIONED CONTAINERS.

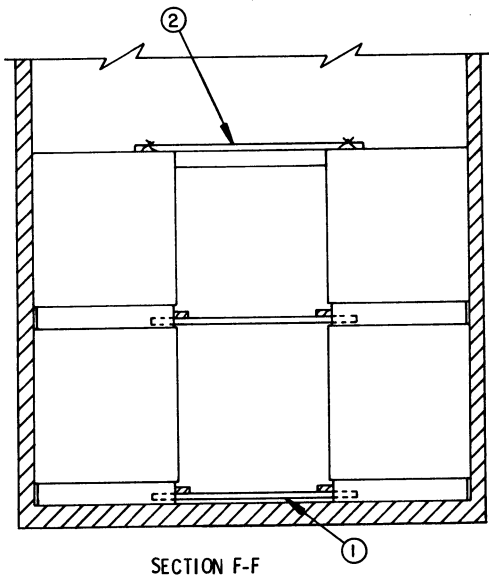


ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 21.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 6 ON PAGE 21.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 30. SEE SPECIAL NOTES 7, 8, AND 11 ON PAGE 21.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 43") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 33. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 10 ON PAGE 21.

SEE GENERAL NOTE
"F" ON PAGE 2.



SECTION F-F

6-LAYER UNIT

56-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 75 AND 78 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE 6-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 20. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 50'-6" ----- 48 UNITS ----- 61,056 POUNDS (APPROX)
 40'-6" ----- 36 UNITS ----- 45,792 POUNDS (APPROX)
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 SEVEN (7) 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 OPENINGS DECREASES.
4. PALLET UNITS MUST BE POSITIONED WITH THE BASE ENDS OF THE CONTAINERS AGAINST THE CAR SIDEWALLS IN ORDER FOR THE VERTICAL PIECES OF "CENTER GATE C" TO BE PROPERLY ALIGNED WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. IF DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ⑤, 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 10.
6. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 20, MUST BE INSTALLED IN EACH END OF THE CAR 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 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' CAR, THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.
7. CENTER GATE "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 80 FOR GUIDANCE.
8. 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 20, INSTALL TWO (2) "CENTER GATES G" AS DETAILED ON PAGE 81. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 80.
9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO "CENTER GATE C", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 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 ⑤ IN THE LOAD ON PAGE 20, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 28.
11. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECE MARKED ⑤, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE, TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING.

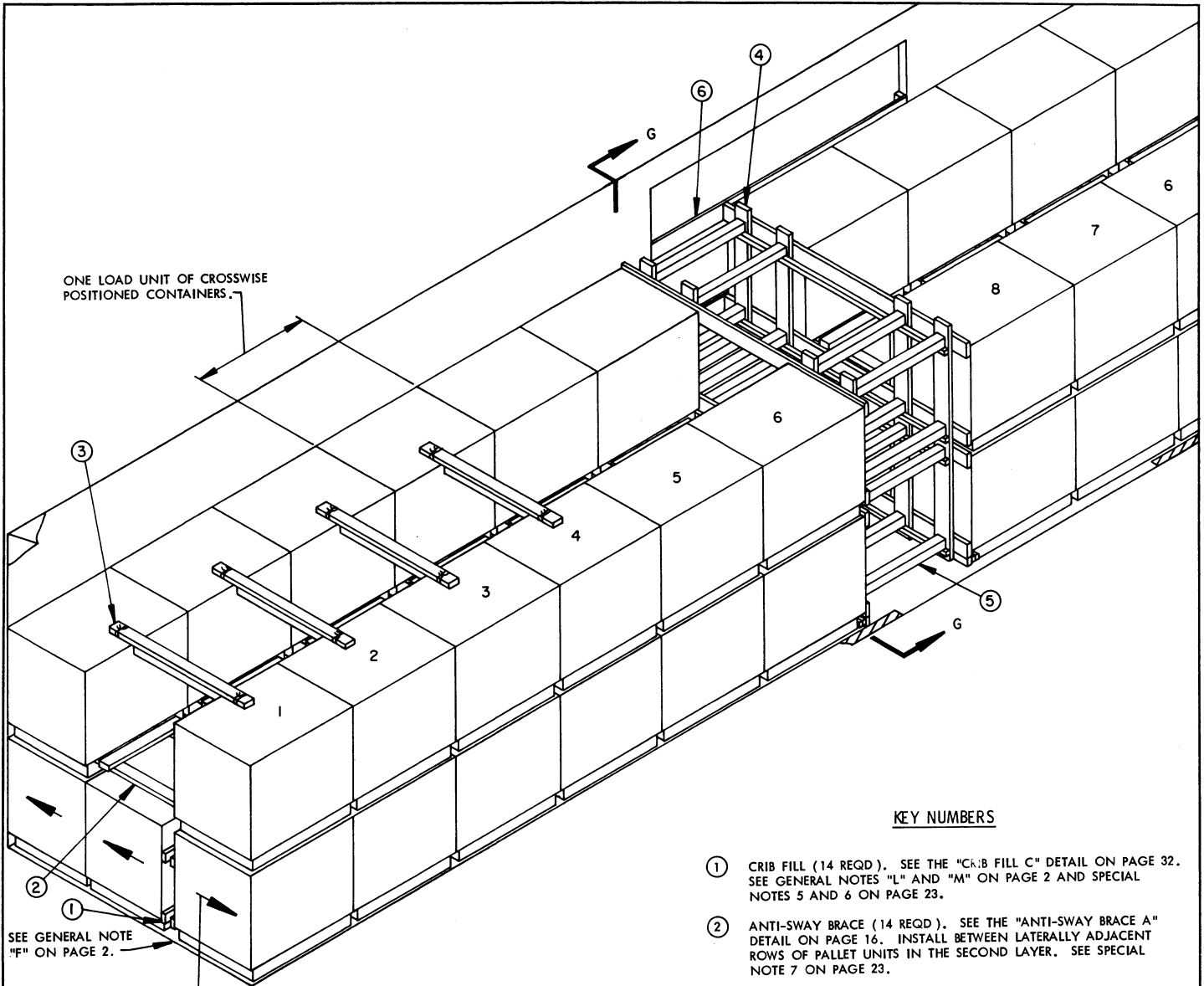
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	92	31
2" X 3"	31	16
2" X 4"	481	321
2" X 6"	137	137
4" X 4"	58	78
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	560	8-3/4
12d (3-1/4")	76	1-1/2
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	56	71,232 LBS
DUNNAGE-----		1,260 LBS
TOTAL WEIGHT-----		72,492 LBS

6-LAYER UNIT
 56-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



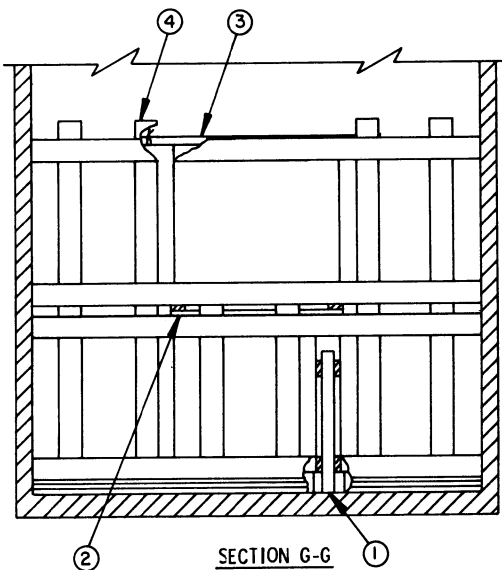
ISOMETRIC VIEW

SEE GENERAL NOTE "F" ON PAGE 2.

DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS. SEE SPECIAL NOTE 4 ON PAGE 23.

KEY NUMBERS

- ① CRIB FILL (14 REQD). SEE THE "CRIB FILL C" DETAIL ON PAGE 32. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTES 5 AND 6 ON PAGE 23.
- ② ANTI-SWAY BRACE (14 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS IN THE SECOND LAYER. SEE SPECIAL NOTE 7 ON PAGE 23.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 8 ON PAGE 23.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 30. SEE SPECIAL NOTES 9, 10, AND 13 ON PAGE 23.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 43") (20 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T" AND "U" ON PAGES 2 AND 3.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 33. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 12 ON PAGE 23.



SECTION G-G

6-LAYER UNIT

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

(SPECIAL NOTES CONTINUED)

12. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 22, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR A COMBINATION OF PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 28.
13. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECES MARKED (4), THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE, TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING. IF THE CENTER ROW IS STACKED 2-HIGH, THE VERTICAL PIECES OF THE CENTER GATE ADJACENT TO THE ANTI-SWAY BRACE MUST BE WIRE TIED TO THE RETAINER PIECE OF THE ANTI-SWAY BRACE TO PREVENT DISPLACEMENT OF THE CENTER GATE. IN A CAR EQUIPPED WITH SLIDING DOORS IN LIEU OF USING THE 2" X 6" X 12" PIECES.
14. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FIVE (5) PALLET 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, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78.
15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 75 AND 78 FOR GUIDANCE.
16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE 6-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 22. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 50'-6" CARS -----60 UNITS-----76,320 LBS (APPROX)
 40'-6" CARS -----45 UNITS-----57,240 LBS (APPROX)

 IF THE CAR IS LOADED 2-HIGH IN THE CENTER ROW, THE FOLLOWING LOADS CAN BE ACHIEVED:

 60'-8" CARS -----84 UNITS-----106,848 LBS (APPROX)
 50'-6" CARS -----72 UNITS-----91,384 LBS (APPROX)
 40'-6" CARS -----54 UNITS-----68,688 LBS (APPROX)
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 SEVEN (7) 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. PALLET UNITS MUST BE LOADED WITH THE BASE ENDS OF THE CONTAINERS POSITIONED AS SHOWN BY THE DIRECTION OF THE ARROWS IN THE LOAD ON PAGE 22. THIS ARRANGEMENT WILL PROPERLY ALIGN THE VERTICAL PIECES OF THE "CENTER GATE C" WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. CRIB FILL, SHOWN AS PIECE MARKED (1) IN THE LOAD ON PAGE 22, MUST BE INSTALLED. IF THE CENTER ROW OF PALLET UNITS IS ALSO LOADED 2-HIGH, FOUR (4) "CRIB FILL C" ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD REGARDLESS OF CAR LENGTH. "CRIB FILL D", AS DETAILED ON PAGE 32, WILL BE USED FOR THE REMAINDER OF UNITS IN A 2-HIGH LOAD. IF A CAR IS LESS THAN 9'-4" WIDE, CRIB FILL WILL NOT BE REQUIRED. NOTE THAT AN EXCESS SPACE ACROSS THE CAR MAY BE FILLED BY NAILING MATERIAL TO THE CAR SIDEWALL ON ONE OR BOTH SIDES AT THE SAME HEIGHTS AS SHOWN FOR THE DOORWAY PROTECTION, PIECE MARKED (6). ADJUST THE WIDTH OF THE CENTER GATES AS NECESSARY.
6. IF DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 28 ARE USED IN LIEU OF WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (4), NAILED FLOORLINE BLOCKING MUST BE USED. 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. NOTE THAT THE VERTICAL PIECES OF THE CRIB FILL, PIECE MARKED (1), WHICH IS IN THE DOORWAY MUST HAVE THREE INCHES (3") CUT OFF THE BOTTOM END WHERE IT RESTS ON THE NAILED FLOORLINE BLOCKING.
7. ANTI-SWAY BRACES, SHOWN AS PIECE MARKED (2), MUST BE INSTALLED BETWEEN ALL OF THE TOP TIER PALLET UNITS AS SHOWN IN THE LOAD ON PAGE 22.
8. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (3) IN THE LOAD ON PAGE 22, 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 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60' LONG CAR, THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.
9. CENTER GATE "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 80 FOR GUIDANCE.
10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE C", SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 22, INSTALL THREE (3) "CENTER GATES G" AS DETAILED ON PAGE 81. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER. FOR ADDITIONAL INSTALLATION PROCEDURES AND "TIE PIECE APPLICATION" DETAIL, REFER TO PAGE 80.
11. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO CENTER GATE "C", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 FOR GUIDANCE.

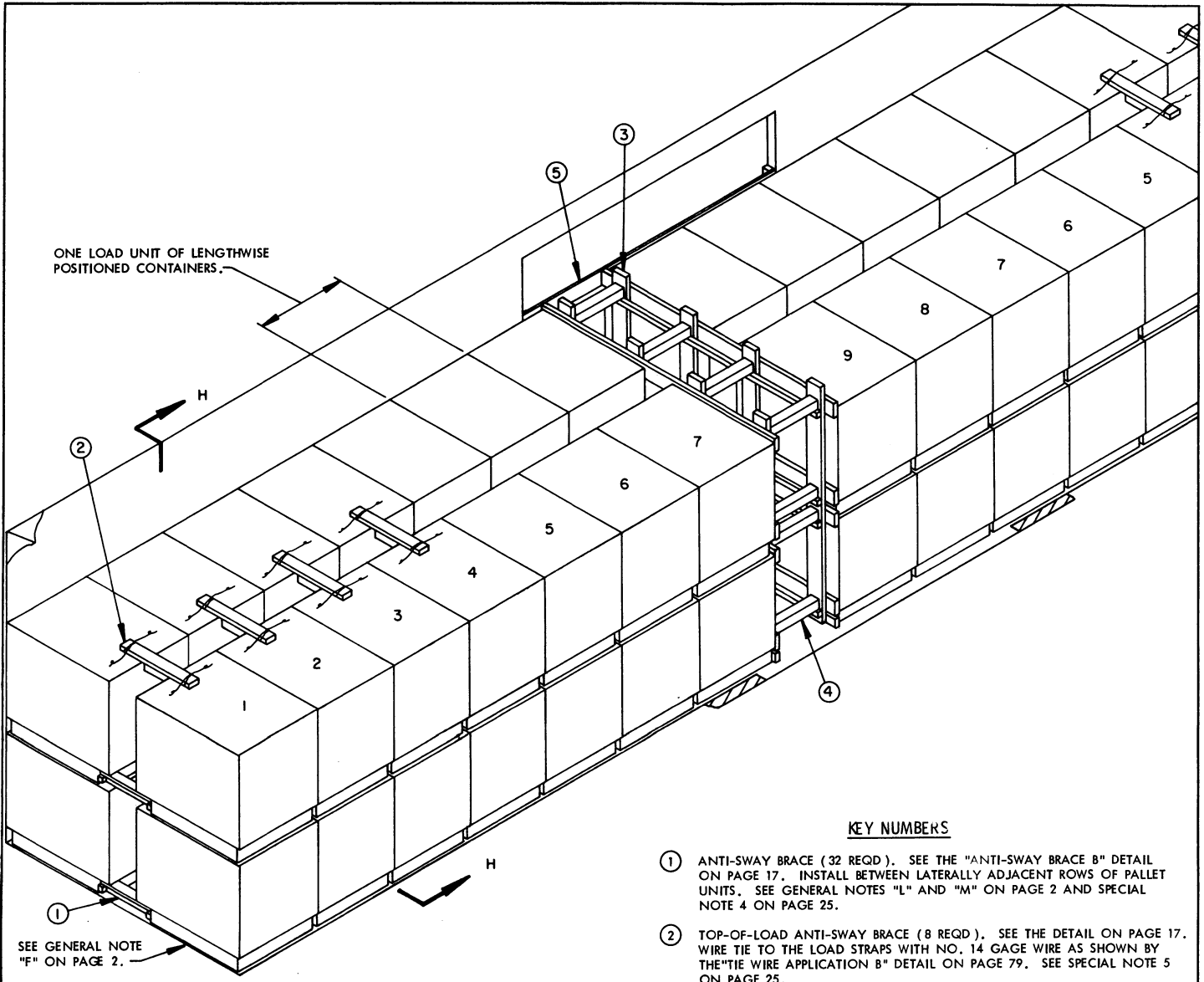
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LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	70	89,040 LBS
DUNNAGE-----		1,431 LBS
TOTAL WEIGHT-----		90,471 LBS

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	92	31
2" X 3"	115	58
2" X 4"	518	346
2" X 6"	137	137
4" X 4"	72	96
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	616	9-1/2
12d (3-1/4")	76	1-1/2
16d (3-1/2")	80	1-3/4
WIRE, NO. 14 GAGE-----	80' REQD-----	1-1/2 LBS

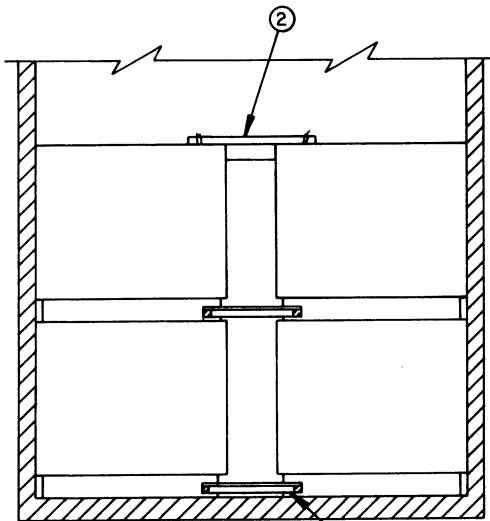
6-LAYER UNIT
70-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 25.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 5 ON PAGE 25.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 31. SEE SPECIAL NOTES 6, 7, AND 8 ON PAGE 25.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 24") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 33. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 25.



SECTION H-H

6-LAYER UNIT

64 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 50 THRU 78 FOR GUIDANCE.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 76 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
2. THE SIX-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 24. USING THE DEPICTED PROCEDURES, MAXIMUM LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:

60'-8" CARS ----- 76 UNITS -----96,672 LBS (APPROX)
40'-6" CARS ----- 48 UNITS -----61,056 LBS (APPROX)
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 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 DOORWAY PROTECTION PROCEDURES, AS SHOWN IN THE LOAD ON PAGE 14 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), 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.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 24, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. FOUR 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' CAR.
6. 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 80 FOR GUIDANCE.
7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE D", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 24, INSTALL TWO (2) "CENTER GATES H" AS DETAILED ON PAGE 82. 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 80.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATES "D", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 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 LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 24 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 14.

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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	104	35
1" X 6"	80	40
2" X 2"	261	87
2" X 3"	38	19
2" X 4"	140	94
2" X 6"	137	137
4" X 4"	32	43
NAILS	NO. REQD	POUNDS
6d (2")	560	3-1/2
10d (3")	468	7-1/4
12d (3-1/4")	52	1
16d (3-1/2")	64	1-1/2
WIRE, NO. 14 GAGE-----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN

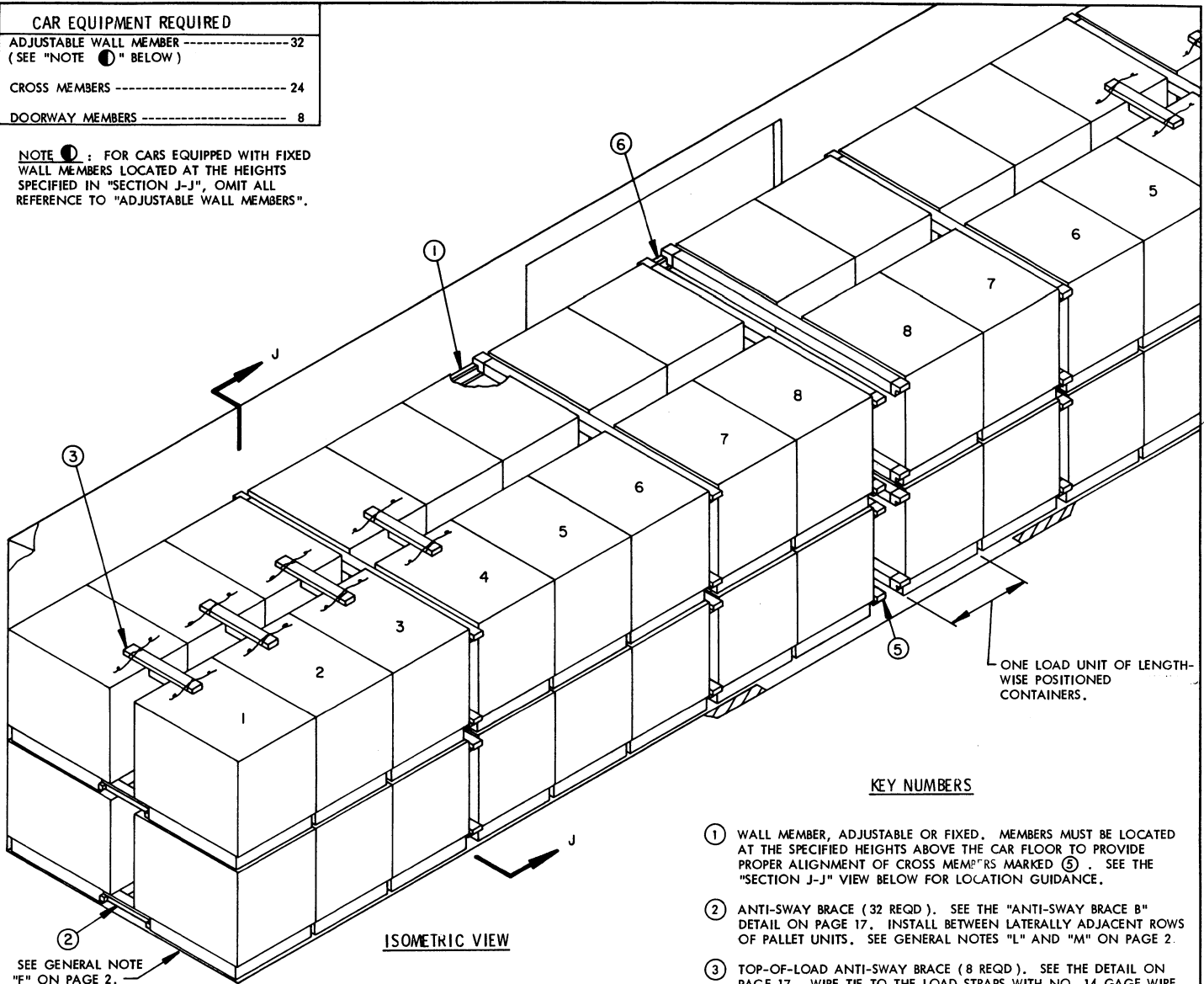
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	64	81,408 LBS
DUNNAGE		925 LBS
TOTAL WEIGHT		82,333 LBS

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

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER -----	32
(SEE "NOTE 1" BELOW)	
CROSS MEMBERS -----	24
DOORWAY MEMBERS -----	8

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

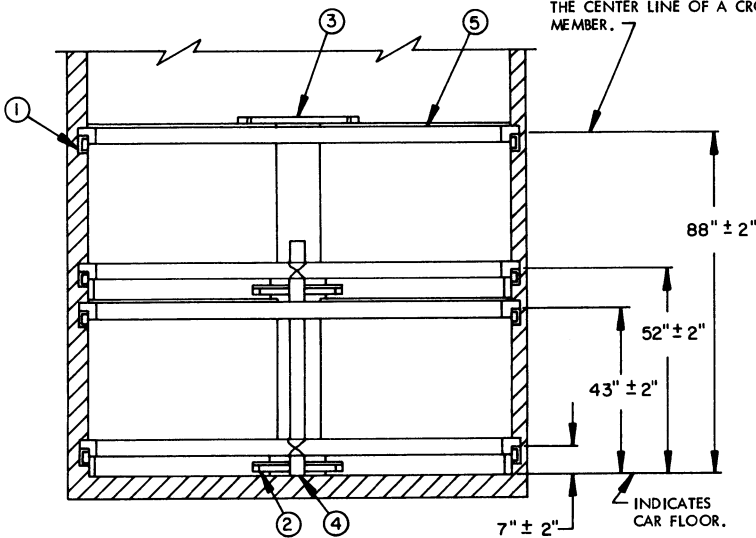


ISOMETRIC VIEW

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤. SEE THE "SECTION J-J" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 4 ON PAGE 27.
- ④ STOP PIECE, 1" X 4" X 60" (10 REQD). INSTALL AT EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION TO PREVENT DISPLACEMENT OF ANTI-SWAY BRACES, PIECE MARKED ②. NAIL TO THE CROSS BRACE OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON NEAR SIDE OF CROSS MEMBERS, WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE. SEE SPECIAL NOTE 5 ON PAGE 27.
- ⑤ CROSS MEMBER (24 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑥ DOORWAY MEMBER (8 REQD). SEE THE "SECTION J-J" VIEW AT LEFT FOR LOCATION GUIDANCE.

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED ① AND/OR A DOORWAY MEMBER MARKED ⑥ IS SPECIFIED TO LOCATE THE CENTER LINE OF A CROSS MEMBER.



SECTION J-J

6-LAYER UNIT

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) 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.
2. THE 6-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 26. A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 61,056 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 "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 26, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. A STOP PIECE, PIECE MARKED ④, IS REQUIRED ON EACH LOAD SIDE OF A CROSS MEMBER TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE.
6. 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 48 AND 49 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

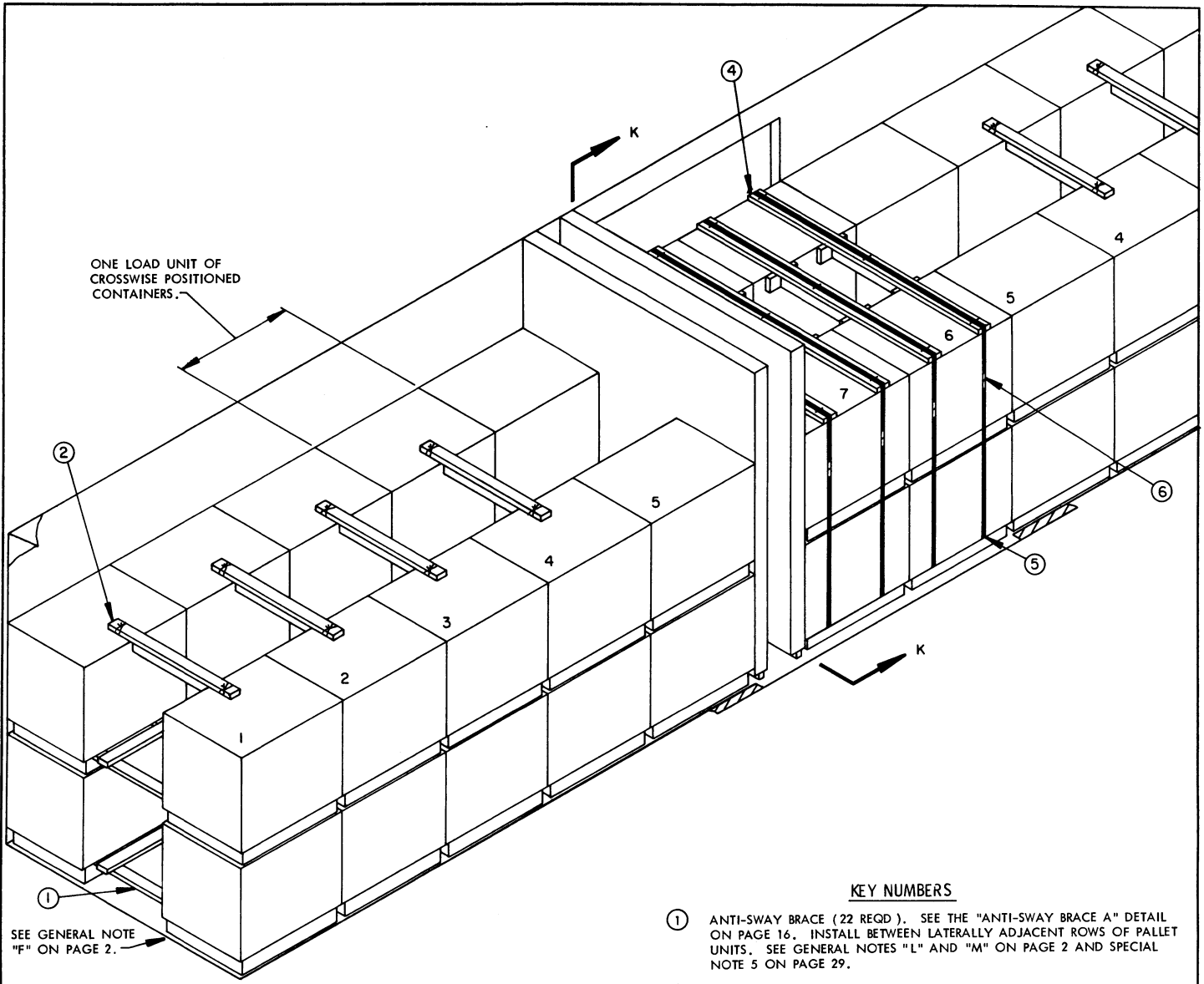
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	144	53
2" X 2"	191	64
2" X 4"	108	74
NAILS	NO. REQD	POUNDS
6d (2")	536	2-3/4
10d (3")	256	4-1/2
12d (3-1/4")	24	1/2
WIRE, NO. 14 GAGE-----128' REQD-----2 LBS		

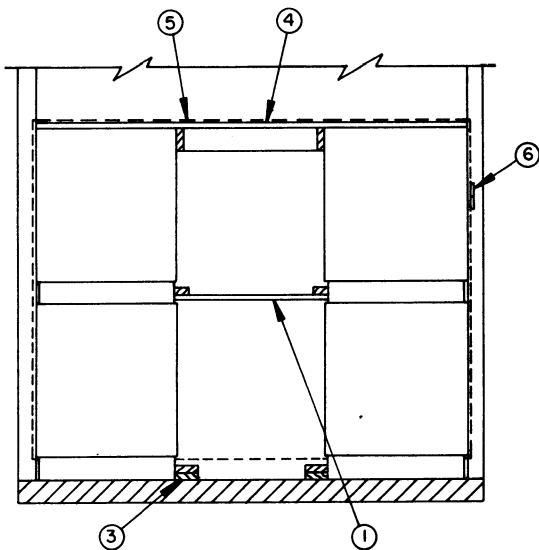
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	64	81,408 LBS
DUNNAGE-----		392 LBS
TOTAL WEIGHT-----		81,800 LBS

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



ISOMETRIC VIEW



KEY NUMBERS

- ① ANTI-SWAY BRACE (22 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 29.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. 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 79. SEE SPECIAL NOTE 4 ON PAGE 29.
- ③ SIDE BLOCKING, 2" X 6" X 48" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING ONE OR TWO BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 29.
- ④ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 18. SEE SPECIAL NOTE 6 ON PAGE 29.
- ⑤ DOORWAY PROTECTION BUNDLING STRAP, 1-1/4" X .035" OR .031" X 34'-0" LONG STEEL STRAPPING (4 REQD). INSTALL AS SHOWN TO ENCIRCLE LOAD UNIT IN DOORWAY. STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 29.
- ⑥ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.

6-LAYER UNIT

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

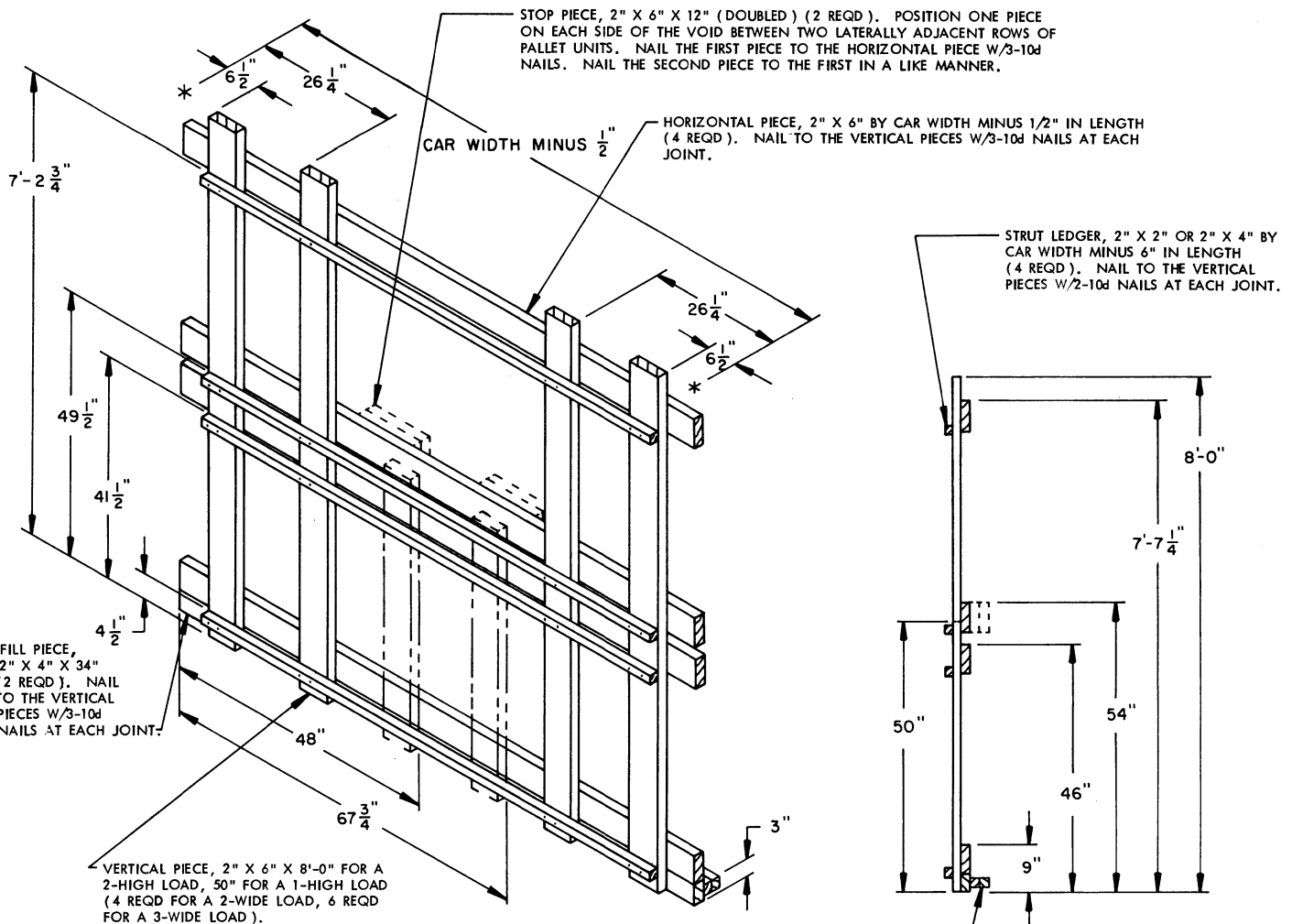
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
 2. THE 6-LAYER UNIT IS SHOWN IN THE LOAD ON PAGE 28. USE THE CHART BELOW TO DETERMINE OTHER MAXIMUM LOADS AS APPLICABLE. SEE SPECIAL NOTE 8.
- | CAR LENGTH | POSITION OF CONTAINERS | NO. OF UNITS | APPROXIMATE LADING WEIGHT |
|------------|------------------------|--------------|---------------------------|
| 60'-8" | CROSSWISE (2-WIDE) | 56 | 71,232 LBS |
| 40'-6" | CROSSWISE (2-WIDE) | 36 | 45,792 LBS |
| 60'-8" | CROSSWISE (3-WIDE) | 84 | 106,848 LBS |
| 50'-6" | CROSSWISE (3-WIDE) | 72 | 91,584 LBS |
| 40'-6" | CROSSWISE (3-WIDE) | 54 | 68,688 LBS |
| 60'-8" | LENGTHWISE | 76 | 96,672 LBS |
| 50'-6" | LENGTHWISE | 64 | 81,408 LBS |
| 40'-6" | LENGTHWISE | 48 | 61,056 LBS |
3. **CAUTION:** PALLET UNITS IN LOAD UNIT NUMBERED 7 IN THE LOAD ON PAGE 28, MUST BE DELETED IF THE OPERATING MECHANISM IS NOT LOCATED ON THE OUTSIDE EDGE OF THE BULKHEAD.
 4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 28, 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 79. FOUR BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR; THREE BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' LONG CAR.
 5. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, WOODEN DOOR GATES, SHOWN AS PIECE MARKED ④ ON PAGE 22 FOR CONTAINERS-CROSSWISE LOADS OR PIECE MARKED ⑤ ON PAGE 24 FOR CONTAINER-LENGTHWISE LOADS, MAY BE USED IN LIEU OF THE SPACER ASSEMBLIES, DOORWAY PROTECTION STRAPS, AND SEALS, PIECES MARKED ④ THRU ⑥. ANTI-SWAY BRACES MAY ALSO BE USED IN LIEU OF THE SIDE BLOCKING, PIECE MARKED ③.
 6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE DEPICTED DOORWAY PROTECTION MAY BE USED WHETHER THE CAR IS EQUIPPED WITH SLIDING DOORS OR WITH PLUG DOORS, HOWEVER, IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, THE NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 28. FOR LENGTHWISE POSITIONED CONTAINERS, REFER TO PAGE 14 FOR GUIDANCE.
 7. **NOTE:** TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDE WALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM SIX INCHES (6") TO ONE-HALF OF THE PALLET LOAD UNIT LENGTH OR WIDTH.
 8. A STRUT ASSEMBLY IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE.
 9. IF THE PALLET UNITS ARE TO BE POSITIONED IN THE CAR WITH THE CONTAINERS CROSSWISE, THE LATERAL BRACING OF THE PALLET UNITS WILL VARY FROM THAT SHOWN ON PAGE 28. FOR A 2-WIDE LOAD OF CROSSWISE POSITIONED CONTAINERS, REFER TO PAGE 20 FOR LOADING GUIDANCE; IF A FULL OR PARTIAL 3-WIDE LOAD IS TO BE SHIPPED, REFER TO PAGE 22 FOR GUIDANCE.
 10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) PALLET UNITS BY OMITTING A ONE OR MORE LOAD UNIT 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 52 THRU 59 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
 11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 75, 76, OR 78, AS APPLICABLE, FOR GUIDANCE.
 12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	388	259
2" X 6"	89	89
NAILS	NO. REQD	POUNDS
10d (3")	264	4-1/4
12d (3-1/4")	108	2
16d (3-1/2")	40	1
STEEL STRAPPING, 1-1/4" X .035" OR .031"---136' REQD---- 20 LBS		
SEAL FOR 1-1/4" STRAPPING----- 8 REQD---- NIL		
STAPLES FOR 1-1/4" STRAPPING----- 12 REQD---- NIL		

LOAD AS SHOWN

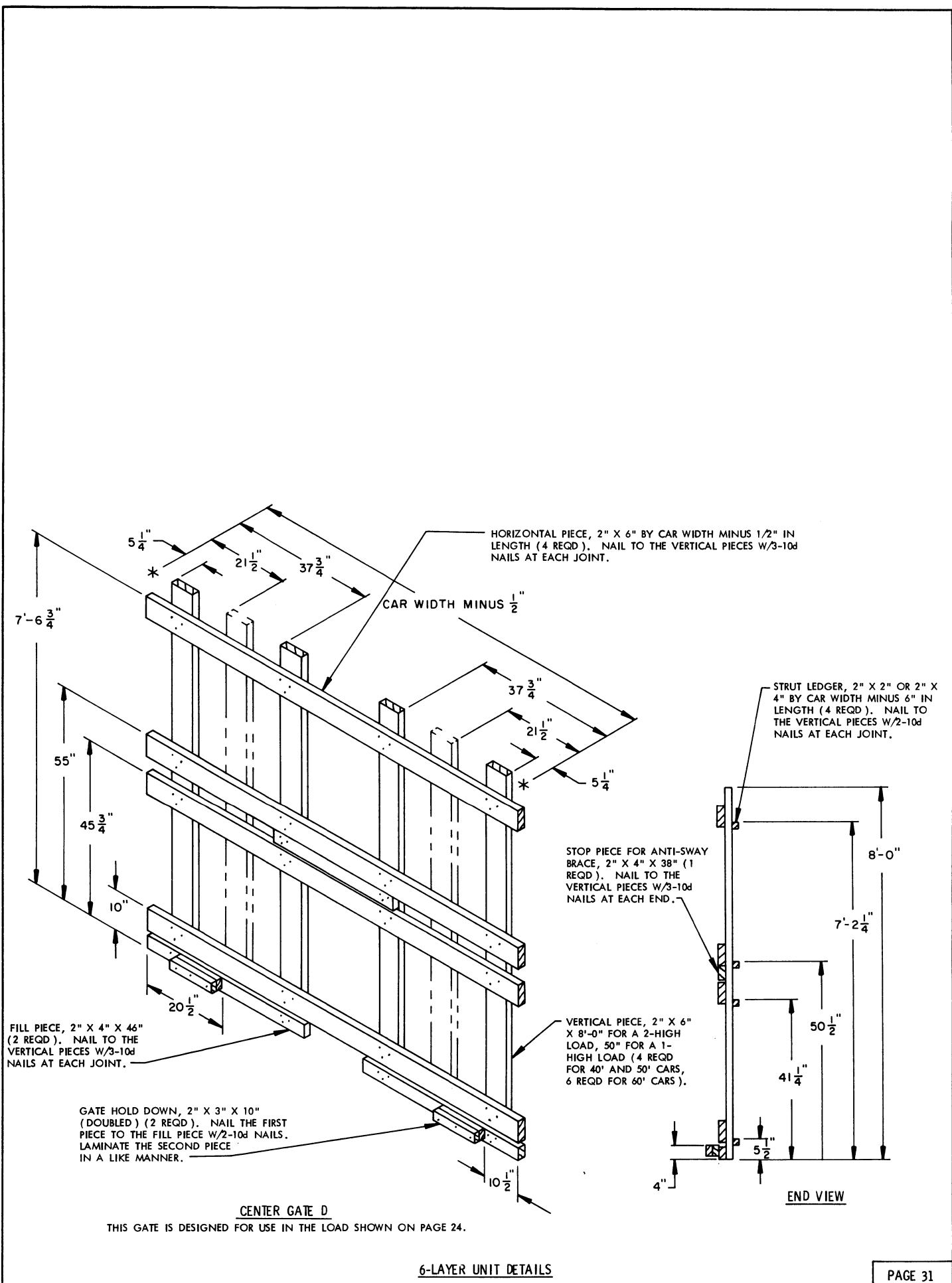
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	48 -----	61,056 LBS
DUNNAGE-----	-----	724 LBS
TOTAL WEIGHT-----		61,780 LBS



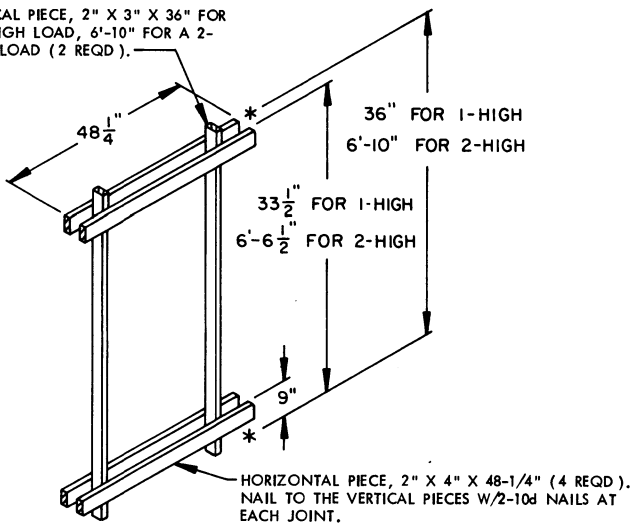
CENTER GATE C

END VIEW

THIS GATE IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 20 AND 22. NOTE THAT LEFT HAND AND RIGHT HAND GATES ARE REQUIRED FOR THE LOAD ON PAGE 22.



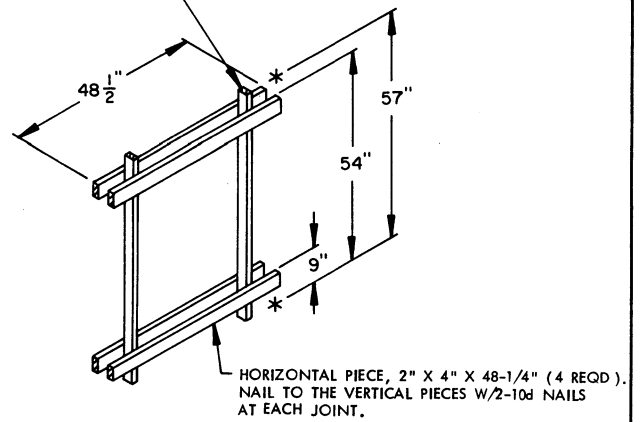
VERTICAL PIECE, 2" X 3" X 36" FOR A 1-HIGH LOAD, 6'-10" FOR A 2-HIGH LOAD (2 REQD.).



CRIB FILL C

CRIB FILL ASSEMBLIES "C" AND "D" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

VERTICAL PIECE, 2" X 3" X 57" (2 REQD.).

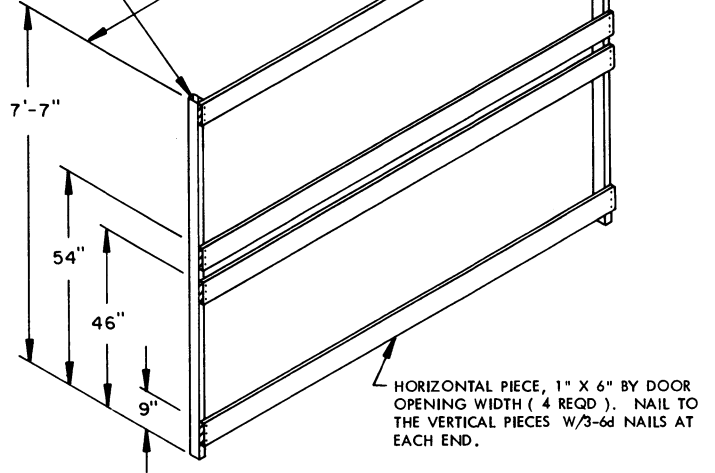


CRIB FILL D

CRIB FILL "D" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "C" THROUGHOUT THE LENGTH OF THE LOAD.

VERTICAL PIECE, 2" X 3" X 7'-7"
(2 REQD). NAIL TO A DOOR
POST W/12d NAILS.

DOOR OPENING
WIDTH

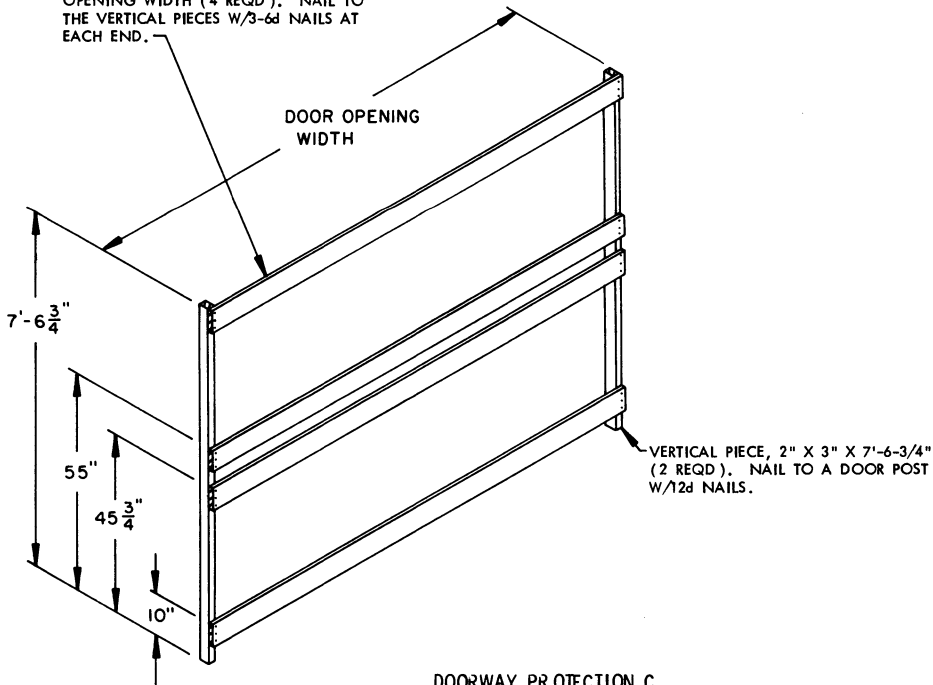


DOORWAY PROTECTION D

THIS ASSEMBLY IS FOR USE IN THE LOAD
SHOWN ON PAGE 24.

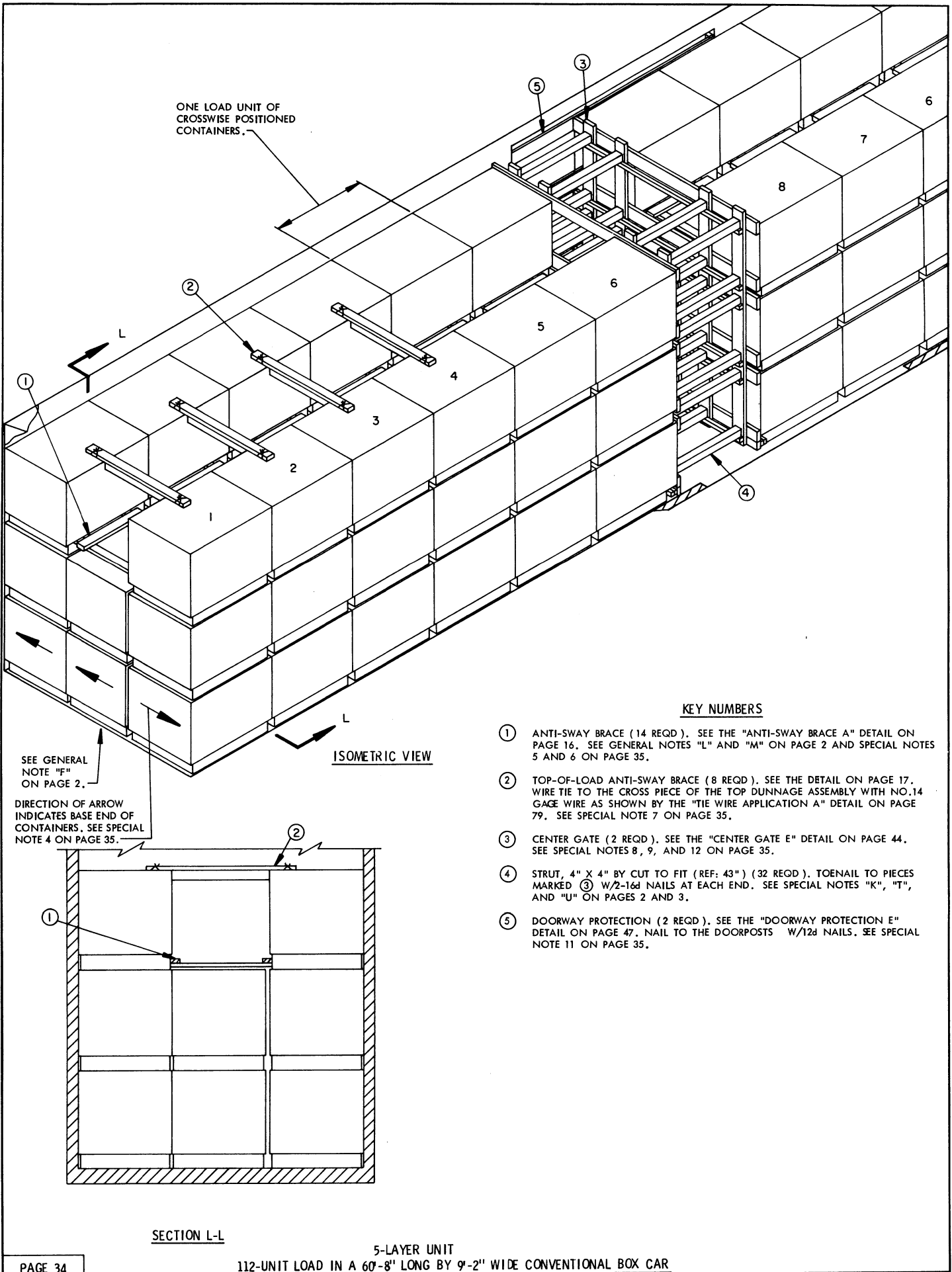
HORIZONTAL PIECE, 1" X 6" BY DOOR
OPENING WIDTH (4 REQD). NAIL TO
THE VERTICAL PIECES W/3-6d NAILS AT
EACH END.

DOOR OPENING
WIDTH



DOORWAY PROTECTION C

THIS ASSEMBLY IS FOR USE IN THE LOADS
SHOWN ON PAGES 20 AND 22.



ONE LOAD UNIT OF
CROSSWISE POSITIONED
CONTAINERS.

SEE GENERAL
NOTE "F"
ON PAGE 2.

DIRECTION OF ARROW
INDICATES BASE END OF
CONTAINERS. SEE SPECIAL
NOTE 4 ON PAGE 35.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (14 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTES 5 AND 6 ON PAGE 35.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO.14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 7 ON PAGE 35.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 44. SEE SPECIAL NOTES 8, 9, AND 12 ON PAGE 35.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 43") (32 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE SPECIAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 47. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 35.

SECTION L-L

5-LAYER UNIT

112-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

12. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECES MARKED ⑤, THE CENTER GATE MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE, TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING. IF THE CENTER ROW IS STACKED 3 HIGH, THE VERTICAL PIECES OF THE CENTER GATE ADJACENT TO THE ANTI-SWAY BRACE MUST BE WIRE TIED TO THE RETAINER PIECE OF THE ANTI-SWAY BRACE TO PREVENT DISPLACEMENT OF THE CENTER GATE, IN A CAR EQUIPPED WITH SLIDING DOORS.
13. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF EIGHT (8) PALLET UNITS, OR 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, OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78 FOR SHIPPING GUIDANCE.
14. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 75 AND 78 FOR SHIPPING GUIDANCE.
15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.
16. A 60'-8" LONG CAR FOR SHIPMENT OF A 112-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 130,000 POUNDS WHEN USING THE DEPICTED OFFSET LOADING PROCEDURES. AN EVENLY POSITIONED 112-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 122,000 POUNDS OR GREATER. A LOAD LIMIT OF AT LEAST 108,200 POUNDS IS REQUIRED FOR AN OFFSET 96-UNIT LOAD IN A 50'-6" LONG CAR; AN EVENLY POSITIONED 96-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 103,900 POUNDS OR GREATER. A 72-UNIT LOAD IN A 40'-6" LONG CAR WILL REQUIRE A LOAD LIMIT OF AT LEAST 86,700 POUNDS.
17. A FULL 3-LAYER LOAD REQUIRES A CAR HAVING A DOOR HEIGHT OF AT LEAST 9'-10" (2" MORE THAN THE HEIGHT OF THE LOAD). IF THE CAR BEING LOADED HAS DOORS OF INSUFFICIENT HEIGHT IT WILL BE NECESSARY TO OMIT THE TOP LAYER FROM LOAD UNIT NO. 8 AND PROBABLY NO. 7. THE PROCEDURES ON PAGE 51 WILL THEN BE APPLIED FOR THE CENTER BRACING OF THE LOAD.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTES 3 AND 5 BELOW AND 17 AT LEFT.
2. THE 5-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 34. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
50'-6" CAR ----- 96 UNITS ----- 103,392 LBS (APPROX)
40'-6" CAR ----- 72 UNITS ----- 77,544 LBS (APPROX)
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 SEVEN (7) 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 OPENINGS DECREASES.
4. PALLET UNITS MUST BE POSITIONED WITH THE BASE END OF THE CONTAINERS AGAINST THE CAR SIDEWALLS IN ORDER FOR THE VERTICAL PIECES OF "CENTER GATE E" TO BE PROPERLY ALIGNED WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. IF THE CAR BEING LOADED IS 9'-4" WIDE OR WIDER, CRIB FILL MUST BE INSTALLED IN THE SPACE BETWEEN THE ROWS HAVING THE OPENING ENDS FACING EACH OTHER. SEE PIECE MARKED ① ON PAGE 36 AND SPECIAL NOTE 5 ON PAGE 37 FOR GUIDANCE. NOTE THAT AN EXCESS SPACE ACROSS THE CAR MAY BE FILLED BY NAILING MATERIAL TO THE CAR SIDEWALL ON ONE OR BOTH SIDES AT THE SAME HEIGHTS AS SHOWN FOR THE DOORWAY PROTECTION, PIECE MARKED ⑤. ADJUST THE WIDTH OF THE CENTER GATES AS NECESSARY.
6. ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ①, MUST BE INSTALLED BETWEEN ALL OF THE TOP TIER PALLET UNITS AS SHOWN IN THE LOAD ON PAGE 34.
7. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 34, 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 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A 60' LONG CAR, THREE (3) BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' CAR.
8. CENTER GATE "E" 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 80 FOR GUIDANCE.
9. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH CENTER GATE "E", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 34, INSTALL THREE (3) "CENTER GATES G" AS DETAILED ON PAGE 81. 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 80.
10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO CENTER GATE E, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 FOR GUIDANCE.
11. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 34, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE POSTS. REFER TO PAGES 85 THRU 87 FOR ALTERNATIVE DOORWAY PROTECTION FOR CAR EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 28. IF CAR WIDTH PERMITS, NAILED FLOORLINE BLOCKING MUST BE USED 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.

(CONTINUED AT LEFT)

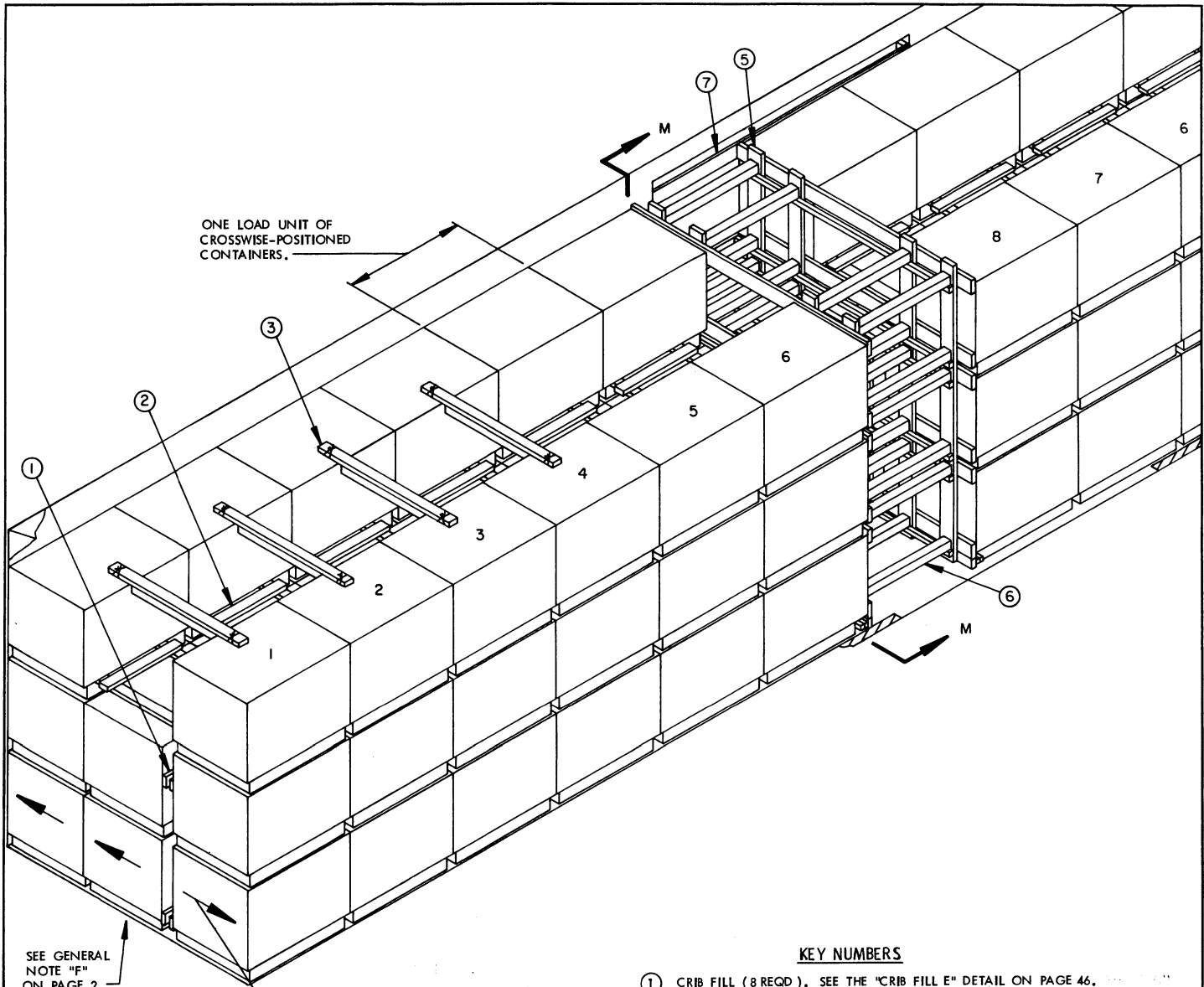
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	120	60
2" X 2"	127	43
2" X 3"	39	20
2" X 4"	278	186
2" X 6"	218	218
4" X 4"	115	154
NAILS	NO. REQD	POUNDS
6d (2")	72	1/2
10d (3")	472	7-1/2
12d (3-14/16")	84	1-1/2
16d (3-1/2")	128	3
WIRE, NO. 14 GAGE-----48' REQD-----1 LB		

LOAD AS SHOWN

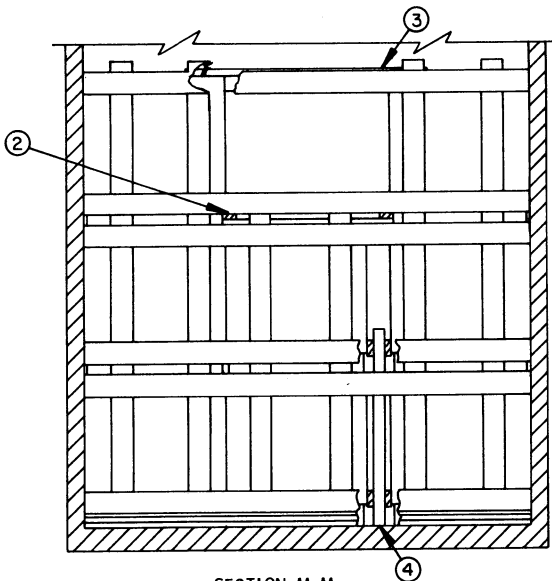
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	112 -----	120,624 LBS
DUNNAGE -----	-----	1,376 LBS

TOTAL WEIGHT----- 122,000 LBS (APPROX)

5-LAYER UNIT
112-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR



ISOMETRIC VIEW



SECTION M-M

KEY NUMBERS

- ① CRIB FILL (8 REQD). SEE THE "CRIB FILL E" DETAIL ON PAGE 46. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTES 5 AND 6 ON PAGE 37.
- ② ANTI-SWAY BRACE (14 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE SPECIAL NOTE 7 ON PAGE 37.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79. SEE SPECIAL NOTE 8 ON PAGE 37.
- ④ CRIB FILL (6 REQD). SEE THE "CRIB FILL F" DETAIL ON PAGE 46.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 44. SEE SPECIAL NOTES 9, 10 AND 13 ON PAGE 37.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 43") (32 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE SPECIAL NOTES "K", "T" AND "U" ON PAGES 2 AND 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 47. NAIL TO THE DOORPOSTS W/12d NAILS. SEE SPECIAL NOTE 12 ON PAGE 37.

5-LAYER UNIT

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

(SPECIAL NOTES CONTINUED)

11. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 2" MATERIAL NAILED TO CENTER GATE "E", PROVIDING THE CAR BEING LOADED HAS AVAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 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 BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 36, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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 28.
13. IF DOORWAY PROTECTION PROCEDURES SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECES MARKED ⑦, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CENTER GATE TWO DOUBLED 2" X 6" X 12" PIECES POSITIONED ON THE BOTTOM HORIZONTAL OF THE TOP LAYER. STOP PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE OPENING. IF THE CENTER ROW IS STACKED 3- HIGH, THE VERTICAL PIECES OF THE CENTER GATE ADJACENT TO THE ANTI-SWAY BRACE MUST BE WIRE TIED TO THE RETAINER PIECE OF THE ANTI-SWAY BRACE TO PREVENT DISPLACEMENT OF THE CENTER GATE IN A CAR EQUIPPED WITH SLIDING DOORS IN LIEU OF USING THE 2" X 6" X 12" PIECES.
14. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF EIGHT (8) PALLET UNITS, 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. OR THE ENTIRE ONE OR TWO TOP TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78 FOR GUIDANCE.
15. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 75 AND 78 FOR GUIDANCE.
16. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.
17. A 60'-8" LONG CAR FOR SHIPMENT OF A 112-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 130,300 POUNDS WHEN USING THE DEPICTED OFFSET LOADING PROCEDURES. AN EVENLY POSITIONED 112-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 122,300 POUNDS OR GREATER. A LOAD LIMIT OF AT LEAST 108,500 POUNDS IS REQUIRED FOR AN OFFSET 96-UNIT LOAD IN A 50'-6" LONG CAR; AN EVENLY POSITIONED 96-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 105,000 POUNDS OR GREATER. A 72-UNIT LOAD IN A 40'-6" LONG CAR WILL REQUIRE A LOAD LIMIT OF 86,900 POUNDS OR GREATER.
18. IF EACH LOAD UNIT CONSISTS OF NINE (9) PALLET UNITS THE FOLLOWING CAR LOAD LIMITS WILL APPLY. A 126-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 146,500 POUNDS WHEN USING THE DEPICTED OFFSET LOADING PROCEDURES. AN EVENLY POSITIONED 126-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 137,500 POUNDS OR GREATER. A LOAD LIMIT OF AT LEAST 122,000 POUNDS IS REQUIRED FOR AN OFFSET 108-UNIT LOAD IN A 50'-6" LONG CAR; AN EVENLY POSITIONED 108-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 118,100 POUNDS OR GREATER. AN 81-UNIT LOAD IN A 40'-6" LONG CAR WILL REQUIRE A LOAD LIMIT OF 97,700 POUNDS OR GREATER.
19. A FULL 3-LAYER LOAD REQUIRES A CAR HAVING A DOOR HEIGHT OF AT LEAST 9'-10" (2" MORE THAN THE HEIGHT OF THE LOAD). IF THE CAR BEING LOADED HAS DOORS OF INSUFFICIENT HEIGHT IT WILL BE NECESSARY TO OMIT THE TOP LAYER FROM LOAD UNIT NO. 8 AND PROBABLY NO. 7. THE PROCEDURES ON PAGE 51 WILL THEN BE APPLIED FOR THE CENTER BRACING OF THE LOAD.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTES 3 AND 19 BELOW.
2. THE 5-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 36. USING THE DEPICTED PROCEDURES, LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 50'-6" CAR -----96 UNITS ----- 103,392 LBS (APPROX)
 40'-6" CAR -----72 UNITS ----- 77,544 LBS (APPROX)
 IF THE CAR IS LOADED 3- HIGH IN THE CENTER ROW ALSO, THE FOLLOWING LOADS CAN BE ACHIEVED:
 60'-8" CAR-----126 UNITS----- 135,702 LBS (APPROX)
 50'-6" CAR-----108 UNITS----- 116,316 LBS (APPROX)
 40'-6" CAR-----81 UNITS----- 87,237 LBS (APPROX)
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 SEVEN (7) 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. PALLET UNITS MUST BE LOADED WITH THE BASE ENDS OF THE CONTAINERS POSITIONED AS SHOWN BY THE DIRECTION OF THE ARROWS IN THE LOAD ON PAGE 36. THIS ARRANGEMENT WILL PROPERLY ALIGN THE VERTICAL PIECES OF THE "CENTER GATE E" WITH THE CROSS PIECES OF THE PALLET DUNNAGE ASSEMBLY.
5. CRIB FILL, SHOWN AS PIECES MARKED ① AND ④ IN THE LOAD ON PAGE 36, MUST BE INSTALLED. FOUR (4) "CRIB FILL E" ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF CAR LENGTH. "CRIB FILL F" WILL BE USED FOR THE REMAINDER OF THE UNITS IN THE LOAD. IF THE PALLET UNITS ARE LOADED 3-HIGH IN THE CENTER ROW, FOUR (4) "CRIB FILL G" ASSEMBLIES MUST BE INSTALLED IN EACH END OF THE LOAD; "CRIB FILL H" WILL BE USED FOR THE REMAINING UNITS. SEE THE DETAILS ON PAGE 46. IF A CAR IS LESS THAN 9'-4" WIDE, CRIB FILL IS NOT REQUIRED.
6. IF DOORWAY PROTECTION STRAPS ARE USED IN LIEU OF WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ⑦, NAILED FLOORLINE BLOCKING MUST BE USED. 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. NOTE THAT THE VERTICAL PIECES OF THE CRIB FILL PIECE MARKED ④, WHICH IS IN THE DOORWAY, MUST HAVE THREE INCHES (3") CUT OFF THE BOTTOM END WHERE IT RESTS ON THE NAILED FLOORLINE BLOCKING.
7. ANTI-SWAY BRACES, SHOWN AS PIECE MARKED ②, MUST BE INSTALLED BETWEEN ALL OF THE TOP TIER PALLET UNITS AS SHOWN IN THE LOAD ON PAGE 36.
8. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 36, 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 79.
9. CENTER GATE "E" 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 80 FOR GUIDANCE.
10. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE E" SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 36, INSTALL THREE (3) "CENTER GATE G" AS DETAILED ON PAGE 81. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER. FOR ADDITIONAL INSTALLATION PROCEDURES AND "TIE PIECE APPLICATION" DETAILS REFER TO PAGE 80.

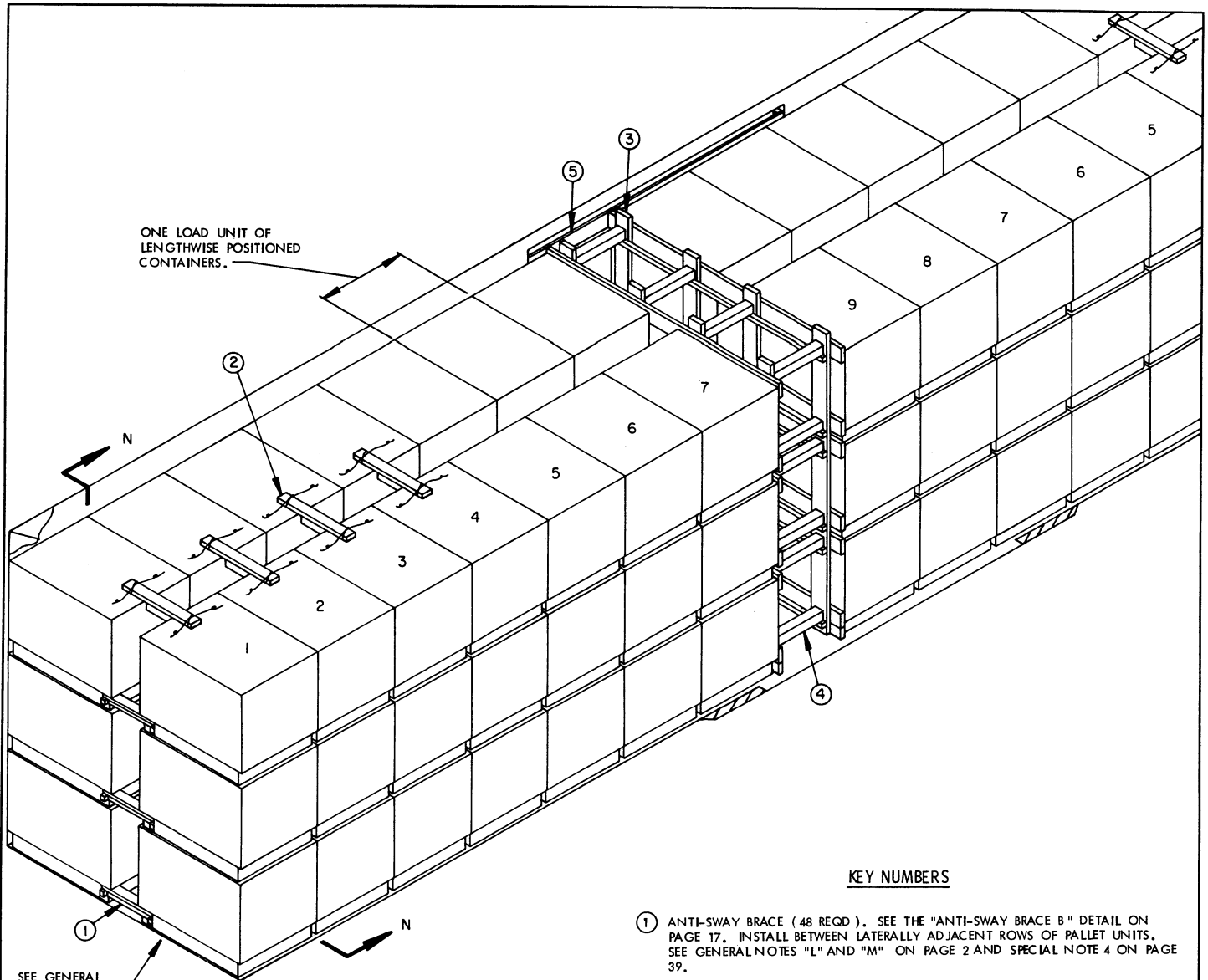
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	120	60
2" X 2"	127	43
2" X 3"	182	91
2" X 4"	518	346
2" X 6"	218	218
4" X 4"	115	154
NAILS	NO. REQD	POUNDS
4d (2")	72	1/2
10d (3")	696	10-3/4
12d (3-1/4")	84	1-1/2
16d (3-1/2")	128	3
WIRE, NO. 14 GAGE	-----48' REQD-----	1 LB

LOAD AS SHOWN

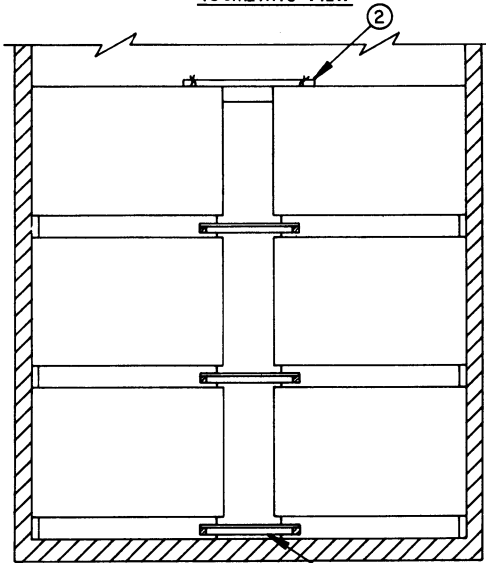
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	-----112-----	120,624 LBS
DUNNAGE	-----	1,453 LBS
TOTAL WEIGHT-----		122,077 LBS

5-LAYER UNIT
 112-UNIT LOAD IN A 60'-8" BY 9'-6" WIDE CONVENTIONAL BOX CAR



SEE GENERAL NOTE "F" ON PAGE 2.

ISOMETRIC VIEW



SECTION N-N

KEY NUMBERS

- ① ANTI-SWAY BRACE (48 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 39.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 5 ON PAGE 39.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 45. SEE SPECIAL NOTES 6, 7 AND 8 ON PAGE 39.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 24") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T" AND "U" ON PAGES 2 AND 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 47. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 39.

5-LAYER UNIT

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

(SPECIAL NOTES CONTINUED)

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 LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 38 IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 85 THRU 87 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, NAILABLE FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 14.
10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) PALLET UNITS, 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 ONE OR TWO TOP TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 50 THRU 78 FOR GUIDANCE.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 76 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.
13. A FULL 3-LAYER LOAD REQUIRES A CAR HAVING A DOOR HEIGHT OF AT LEAST 9'-10" (2" MORE THAN THE HEIGHT OF THE LOAD). IF THE CAR BEING LOADED HAS DOORS OF INSUFFICIENT HEIGHT IT WILL BE NECESSARY TO OMIT THE TOP LAYER FROM LOAD UNITS NO. 8 AND 9 AND POSSIBLY NO. 7. THE PROCEDURES ON PAGE 50 WILL THEN BE APPLIED FOR THE CENTER BRACING OF THE LOAD.
14. A 50'-6" LONG CAR FOR SHIPMENT OF A 96-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 109,500 POUNDS WHEN USING THE DEPICTED OFFSET LOADING PROCEDURES. AN EVENLY POSITIONED 96-UNIT LOAD CAN BE SHIPPED IN A CAR HAVING A LOAD LIMIT OF 104,100 POUNDS OR GREATER. A 114-UNIT LOAD IN A 60'-8" LONG CAR WILL REQUIRE A LOAD LIMIT OF 130,600 POUNDS OR GREATER.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDE OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW AND 13 AT LEFT.
2. THE 5-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 38, USING THE DEPICTED PROCEDURES. LOADS FOR OTHER SIZE CARS ARE AS FOLLOWS:
 60'-8" CAR ----- 114 UNITS ----- 122,778 LBS (APPROX)
 40'-6" CAR ----- 72 UNITS ----- 77,544 LBS (APPROX)
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 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 DOORWAY PROTECTION PROCEDURES AS SHOWN IN THE LOAD ON PAGE 14 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILABLE FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILABLE 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 ONE EITHER SIDE OF THE CAR.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 38, 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 79. FOUR BRACES ARE REQUIRED IN EACH END OF A 40' OR 50' LONG CAR; FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR.
6. CENTER GATE "F" 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 80 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 F", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 38, INSTALL TWO (2) "CENTER GATES H" AS DETAILED ON PAGE 82. 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 80.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATES "F", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 84 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	156	52
1" X 6"	120	60
2" X 2"	391	131
2" X 3"	46	23
2" X 4"	191	128
2" X 6"	190	190
4" X 4"	48	64
NAILS	NO. REQD	POUNDS
6d (2")	840	5
10d (3")	688	10-3/4
12d (3-1/4")	60	1
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE -----80' REQD-----1-1/2 LBS		

LOAD AS SHOWN

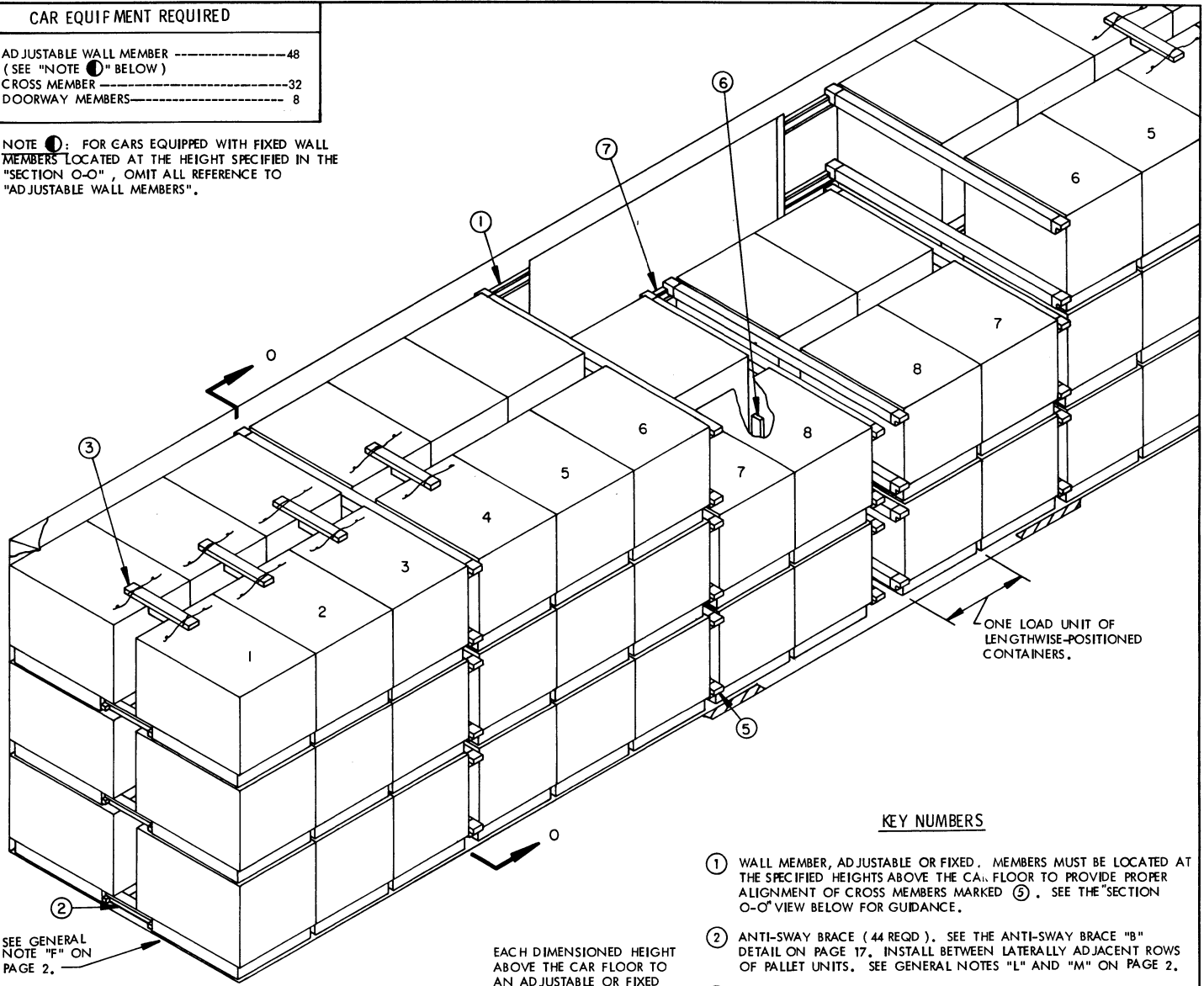
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	-----96-----	103,392 LBS
DUNNAGE	-----	1,317 LBS
TOTAL WEIGHT-----		104,709 LBS

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

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER -----	48
(SEE "NOTE 1" BELOW)	
CROSS MEMBER -----	32
DOORWAY MEMBERS -----	8

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



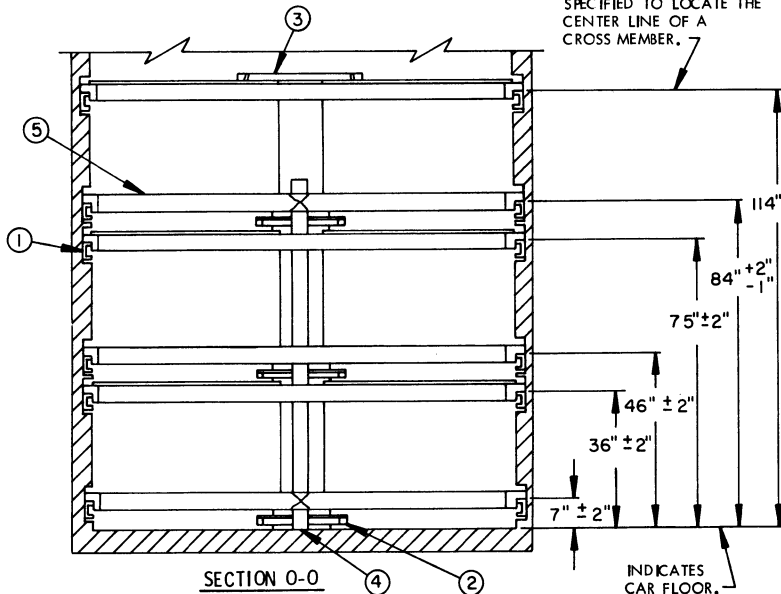
ISOMETRIC VIEW

SEE GENERAL NOTE "F" ON PAGE 2.

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.

KEY NUMBERS

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 5. SEE THE "SECTION O-O" VIEW BELOW FOR GUIDANCE.
- 2 ANTI-SWAY BRACE (44 REQD). SEE THE ANTI-SWAY BRACE "B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. SEE SPECIAL NOTE 4 ON PAGE 41.
- 4 STOP PIECE, 1" X 4" X 7'-6" FOR 3-HIGH STACKS (6 REQD). INSTALL AT EACH 3-HIGH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION TO PREVENT DISPLACEMENT OF ANTI-SWAY BRACES, PIECE MARKED 2. NAIL TO THE CROSS BRACES OF THE UPPER TWO LEVELS OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON REAR SIDE OF CROSS MEMBERS, WIRE TIE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE. SEE SPECIAL NOTE 5 ON PAGE 41.
- 5 CROSS MEMBER (32 REQD). SEE GENERAL NOTE "W" ON PAGE 2.
- 6 STOP PIECE, 1" X 4" X 52" FOR 2-HIGH STACKS (4 REQD). INSTALL AT EACH 2-HIGH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION. INSTALL SIMILAR TO PIECE MARKED 4, NAILING TO BOTH ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT, WHEN APPLICABLE.
- 7 DOORWAY MEMBER (8 REQD). SEE THE "SECTION O-O" VIEW AT LEFT FOR LOCATION GUIDANCE.



SECTION O-O

INDICATES CAR FLOOR.

5-LAYER UNIT

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) 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.
2. THE 5-LAYER UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 40. A MAXIMUM OF SIXTY-FOUR (64) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 68,928 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 "F" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 40, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. STOP PIECES, PIECES MARKED ④ AND ⑤, ARE REQUIRED ON EACH LOAD SIDE OF CROSS MEMBERS TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING Laterally ADJACENT UNITS FROM THE TOP ONE OR TWO LAYERS OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) OR SIX (6) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURE ON PAGES 48 AND 49 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

BILL OF MATERIAL

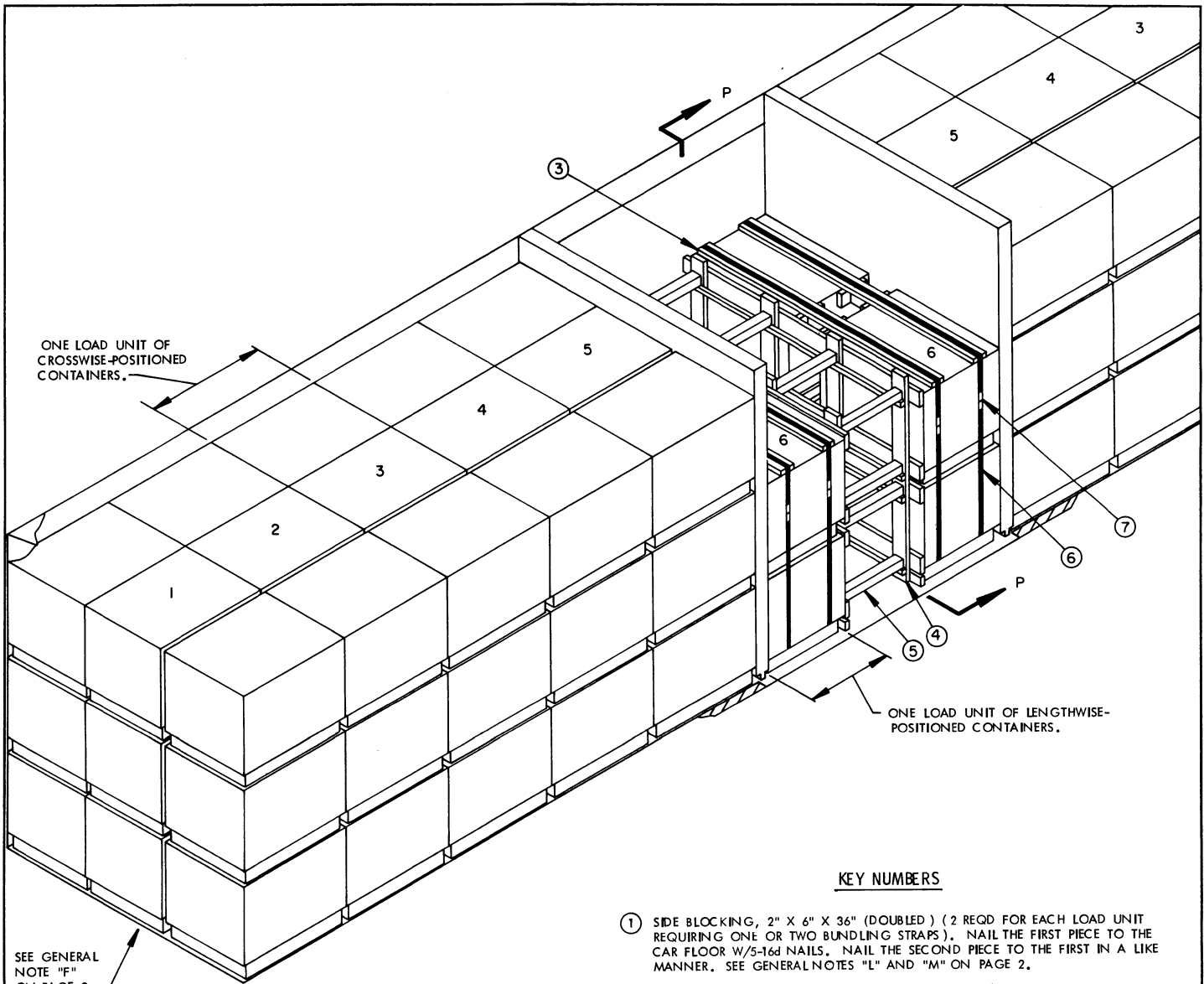
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	191	64
2" X 2"	263	88
2" X 4"	134	90
NAILS	QUANTITY	POUNDS
6d (2")	744	4-1/2
10d (3")	352	5-1/2
12d (3-1/4")	24	1/2
WIRE, NO. 14 GAGE -----128' REQD -----2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----88-----		94,776 LBS
DUNNAGE-----		497 LBS
TOTAL WEIGHT -----		95,273 LBS

5-LAYER UNIT

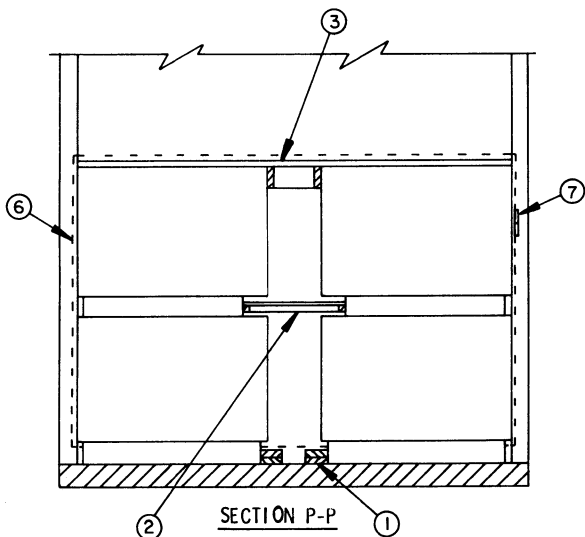
88-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 36" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING ONE OR TWO BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.
- ③ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY A" DETAIL ON PAGE 18.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 45.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 31") (16 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T" AND "U" ON PAGES 2 AND 3.
- ⑥ DOORWAY PROTECTION BUNDLING STRAP, 1-1/4" X .035" OR .031" X 32'-0" LONG STEEL STRAPPING (4 REQD). INSTALL AS SHOWN TO ENCIRCLE LOAD UNITS IN DOORWAY. STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 43.
- ⑦ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.



SECTION P-P

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

(SPECIAL NOTES CONTINUED)

6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE DEPICTED DOORWAY PROTECTION MAY BE USED WHETHER THE CAR IS EQUIPPED WITH SLIDING DOORS OR WITH PLUG DOORS, HOWEVER, IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS THE NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED AS SHOWN IN THE LOAD ON PAGE 42. FOR CROSSWISE POSITIONED CONTAINERS IN THE DOORWAY AREA REFER TO PAGE 28 FOR GUIDANCE. **NOTE:** TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") TO ONE-HALF OF THE PALLET LOAD UNIT LENGTH OR WIDTH.
7. A STRUT ASSEMBLY IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE, UNLESS LADING, CENTER GATES AND STRUTS ARE INSTALLED BETWEEN THE BULKHEADS AS SHOWN.
8. IF THE PALLET UNITS IN EACH END OF THE CAR ARE TO BE POSITIONED WITH THE CONTAINERS LENGTHWISE, LATERAL BRACING MUST BE INSTALLED. REFER TO PAGE 40 FOR LOADING GUIDANCE.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 3-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF NINE (9) PALLET UNITS. 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 END PORTION OF THE LOAD. OR, THE ENTIRE ONE OR TWO TOP TIERS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 52 THRU 59 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 75, 76, OR 78 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 77 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENING CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3 AND SPECIAL NOTE
2. THE 5-LAYER UNIT IS SHOWN IN THE LOAD ON PAGE 42. USING THIS PROCEDURE, THE FOLLOWING CROSSWISE LOADS CAN BE ACHIEVED. SEE SPECIAL NOTE 8.

CAR LENGTH	TOTAL NO. OF UNITS	APPROX NO. OF POUNDS	CROSSWISE NO. EACH END	NO. LONG IN DOORWAY
60'-8"	120	129,240	6	2 CROSSWISE
40'-6"	72	77,544	3	3 CROSSWISE

TO ACHIEVE A LENGTHWISE LOAD STACKED 3-HIGH IN EACH END AND 2-HIGH BETWEEN THE LOAD DIVIDERS, USE THE FOLLOWING CHART AND REFER TO PAGE 14 FOR ADDITIONAL GUIDANCE.

CAR LENGTH	TOTAL NO. OF UNITS	APPROX NO. OF POUNDS	LENGTHWISE NO. EACH END	NO. LONG IN DOORWAY
60'-8"	108	116,316	8	3 LENGTHWISE OR 2 CROSSWISE
50'-6"	84	90,468	6	3 LENGTHWISE OR 2 CROSSWISE
40'-6"	68	73,236	5	2 LENGTHWISE

NOTE: CONTAINERS POSITIONED CROSSWISE BETWEEN THE LOAD DIVIDERS WILL REQUIRE THE USE OF CENTER GATE "E"; CENTER GATE "F" WILL BE USED FOR LENGTHWISE POSITIONED CONTAINERS. IF THE LENGTH OF THE PALLET UNITS ARE STACKED 3-WIDE ACROSS THE CAR BETWEEN THE LOAD DIVIDERS, A STRAPPING BOARD WILL NOT BE REQUIRED. ALIGN THE DOORWAY PROTECTION STRAP WITH THE VERTICAL PIECE OF THE END DUNNAGE ASSEMBLY.

3. IF THE CAR BEING LOADED IS 9'-4" OR WIDER, CRIB FILL WILL BE REQUIRED IN EACH END OF THE CAR. SEE THE "CRIB FILL G" AND "CRIB FILL H" DETAILS ON PAGE 46.
4. TOP-OF-LOAD ANTI-SWAY BRACES ARE NOT REQUIRED FOR THE LOAD AS SHOWN IN A 9'-2" WIDE CAR; REQUIRED FOR WIDER CARS.
5. IF THE CAR BEING LOADED IS EQUIPPED WITH SLIDING DOORS, WOODEN DOOR GATES, SHOWN AS PIECES MARKED (5) ON PAGE 38 FOR CONTAINERS - LENGTHWISE OR PIECE MARKED (7) ON PAGE 36 FOR CONTAINERS - CROSSWISE, MAY BE USED IN LIEU OF THE SPACER ASSEMBLIES, DOORWAY PROTECTION STRAPS AND SEALS, PIECES MARKED (3), (6) AND (7). ANTI-SWAY BRACES MAY ALSO BE USED IN LIEU OF THE SIDE BLOCKING, PIECE MARKED (1).

(CONTINUED AT LEFT)

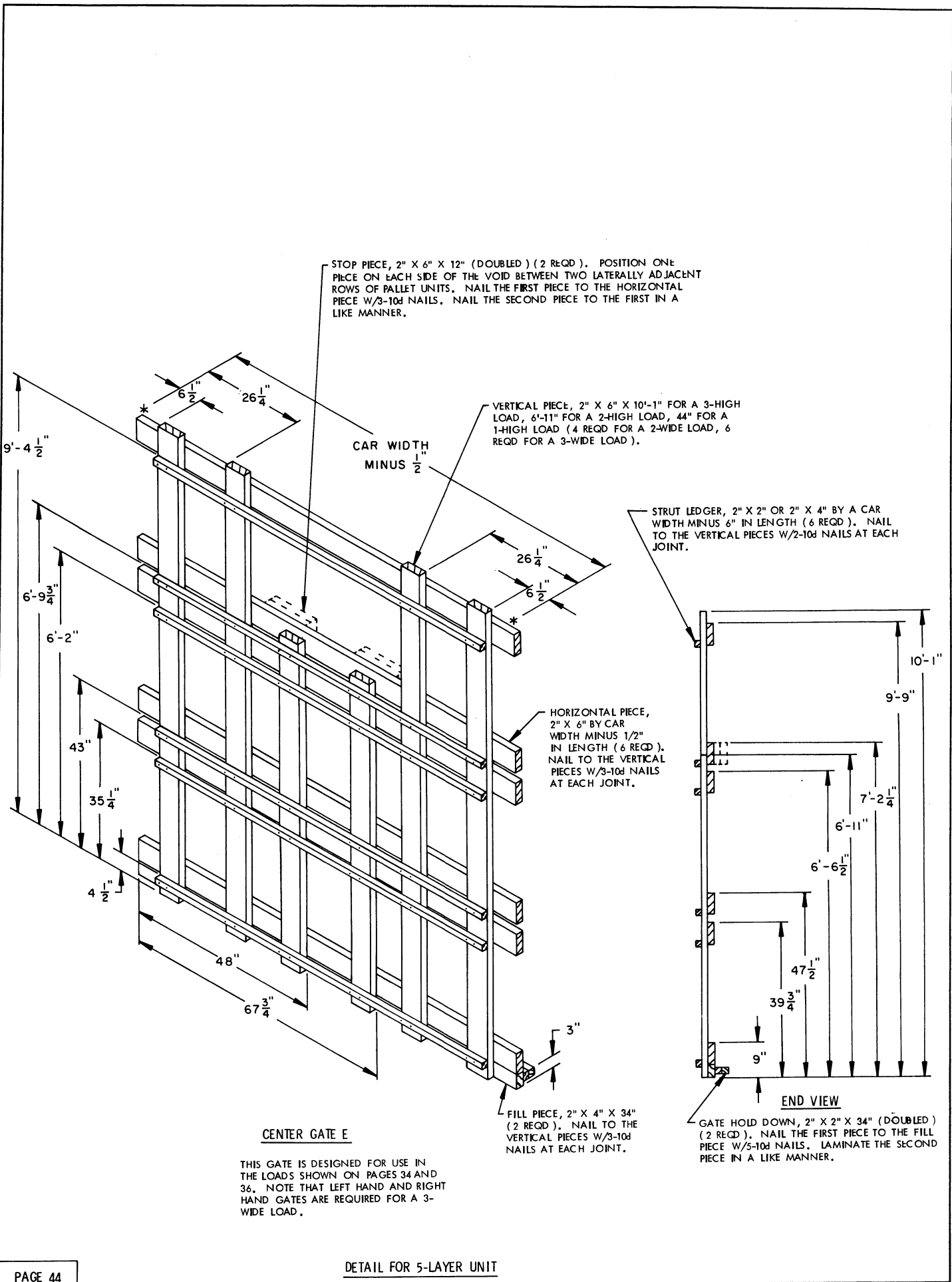
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	7	3
2" X 2"	82	28
2" X 3"	7	4
2" X 4"	26	18
2" X 6"	200	200
4" X 4"	42	56
NAILS	NO. REQD	POUNDS
6d (2")	32	1/4
10d (3")	260	4
12d (3-1/4")	48	1
16d (3-1/2")	104	2-1/2
STEEL STRAPPING, 1-1/4" X .035" OR .031" ----- 128' REQD----- 19 LBS		
SEAL FOR 1-1/4" STRAPPING----- 8 REQD-----NIL		
STAPLES FOR 1-1/4" STRAPPING----- 12 REQD-----NIL		

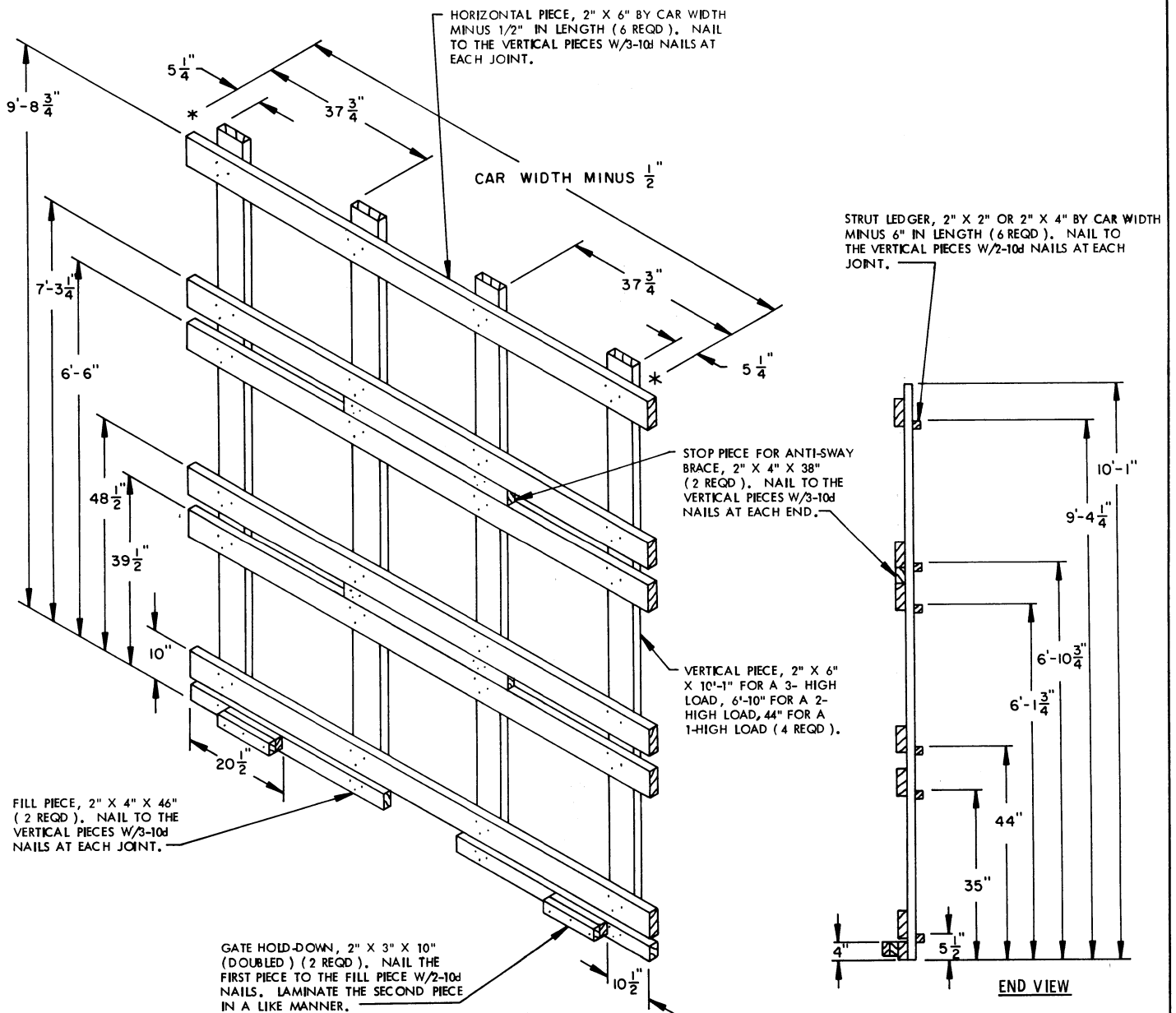
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	98-----	105,546 LBS
DUNNAGE-----	-----	645 LBS
TOTAL WEIGHT-----		106,191 LBS

5-LAYER UNIT

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



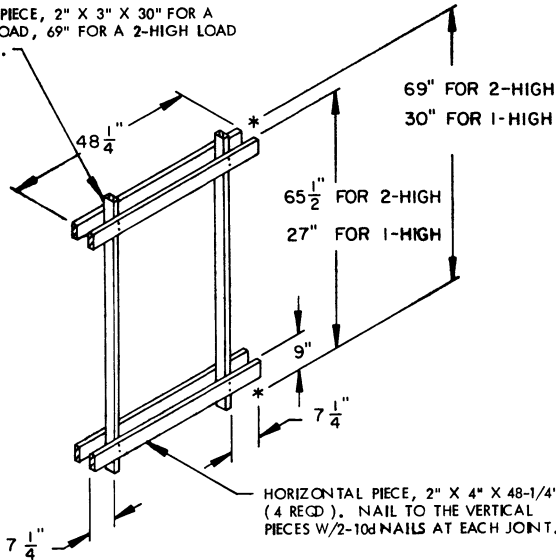


CENTER GATE F

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 38, AND IS ALSO USED IN THE LOAD SHOWN ON PAGE 42.

DETAILS FOR 5-LAYER UNIT

VERTICAL PIECE, 2" X 3" X 30" FOR A 1-HIGH LOAD, 69" FOR A 2-HIGH LOAD (2 REQD).

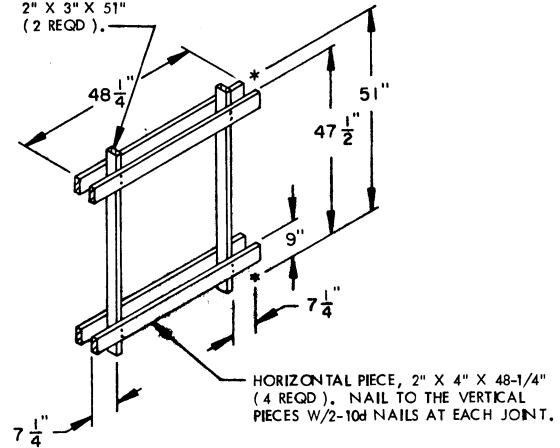


HORIZONTAL PIECE, 2" X 4" X 48-1/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CRIB FILL E

"CRIB FILL E" IS FOR USE WITH ONE AND TWO HIGH LOADS. CRIB FILL ASSEMBLIES SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 3/4" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

VERTICAL PIECE, 2" X 3" X 51" (2 REQD).

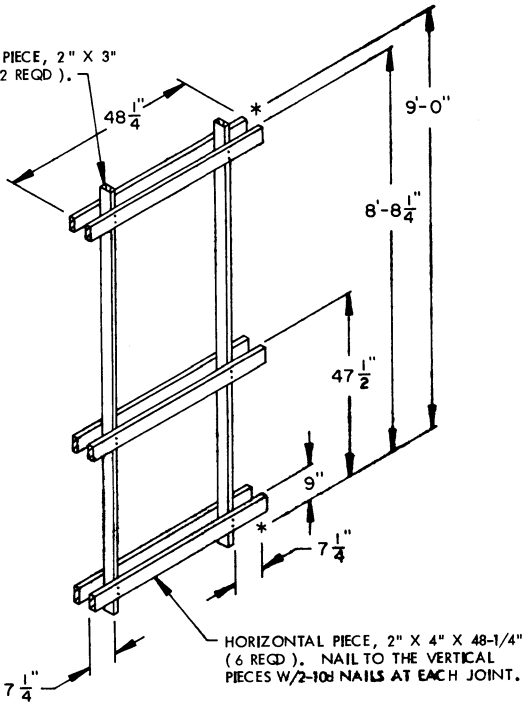


HORIZONTAL PIECE, 2" X 4" X 48-1/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CRIB FILL F

"CRIB FILL F" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE "CRIB FILL E" THROUGHOUT THE LENGTH OF THE LOAD.

VERTICAL PIECE, 2" X 3" X 9'-0" (2 REQD).

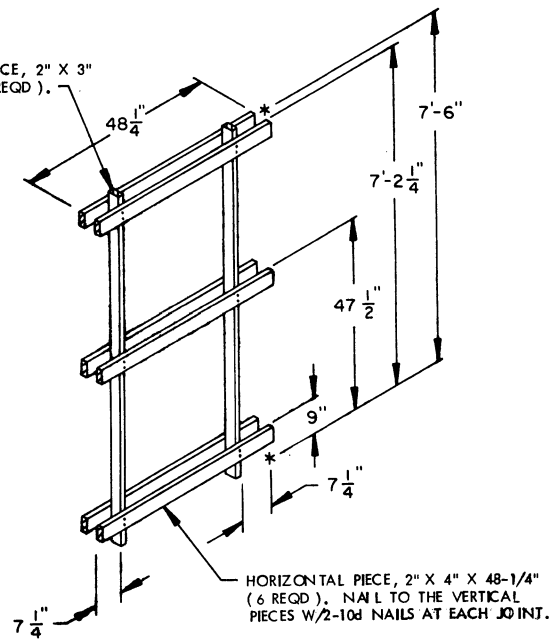


HORIZONTAL PIECE, 2" X 4" X 48-1/4" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CRIB FILL G

"CRIB FILL G" IS FOR USE IN THE ENDS OF THE CAR OF A 3-HIGH LOAD.

VERTICAL PIECE, 2" X 3" X 7'-6" (2 REQD).



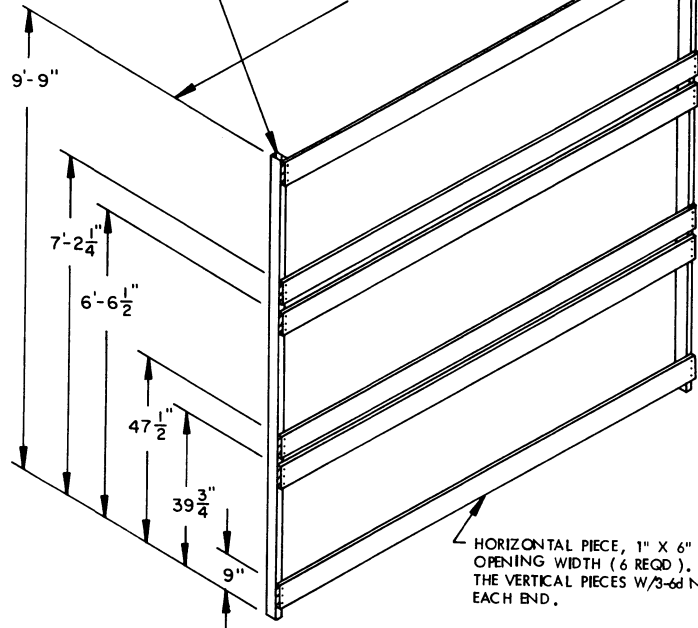
HORIZONTAL PIECE, 2" X 4" X 48-1/4" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CRIB FILL H

"CRIB FILL H" IS FOR USE IN THE CENTER AREA OF A 3-HIGH LOAD.

VERTICAL PIECE, 2" X 3" X 9'-9" (2 REQD.), NAIL TO A DOOR POST W/12d NAILS.

DOOR OPENING WIDTH

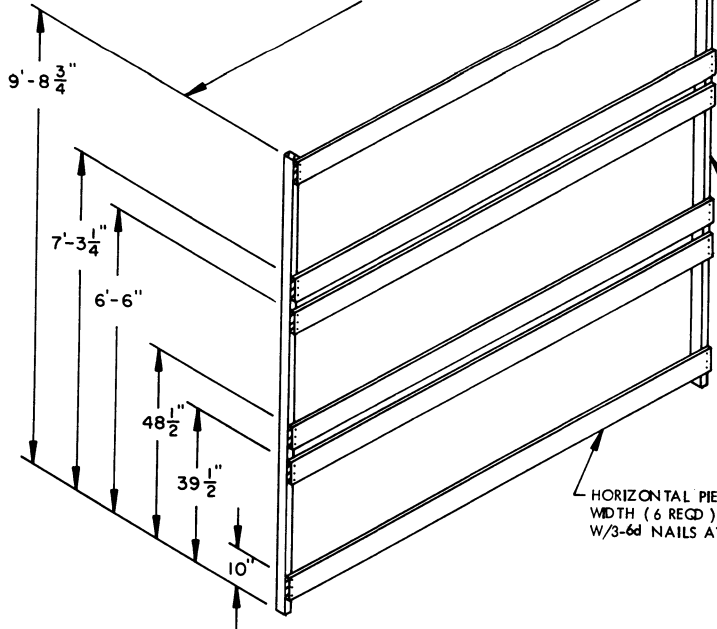


HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (6 REQD.), NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

DOORWAY PROTECTION F

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 38.

DOOR OPENING WIDTH



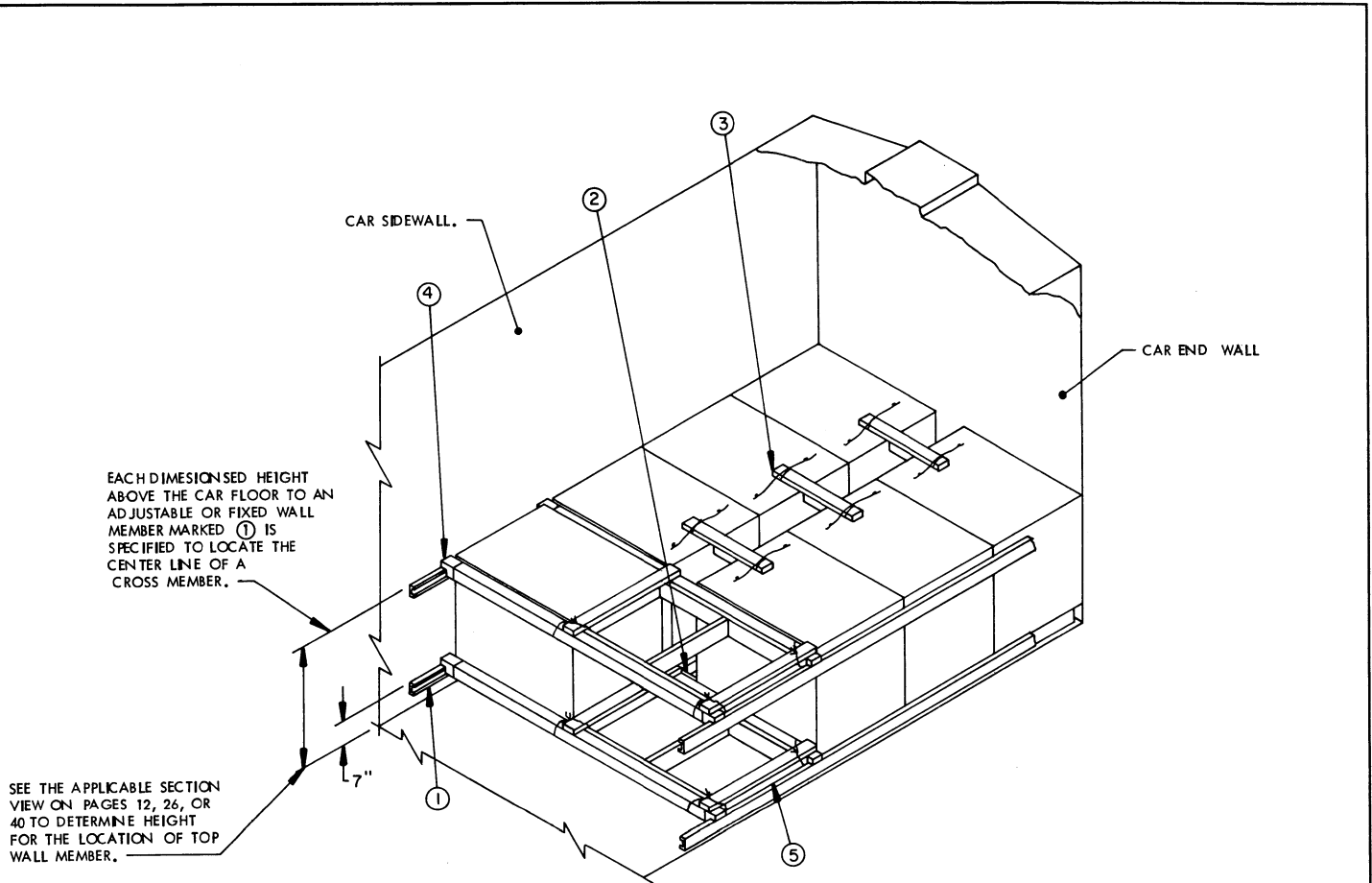
VERTICAL PIECE, 2" X 3" X 9'-8-3/4" (2 REQD.), NAIL TO A DOOR POST W/12d NAILS.

HORIZONTAL PIECE, 1" X 6" BY DOOR OPENING WIDTH (6 REQD.), NAIL TO THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

DOORWAY PROTECTION E

THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 34 AND 36.

DETAILS FOR 5-LAYER UNIT



ISOMETRIC VIEW

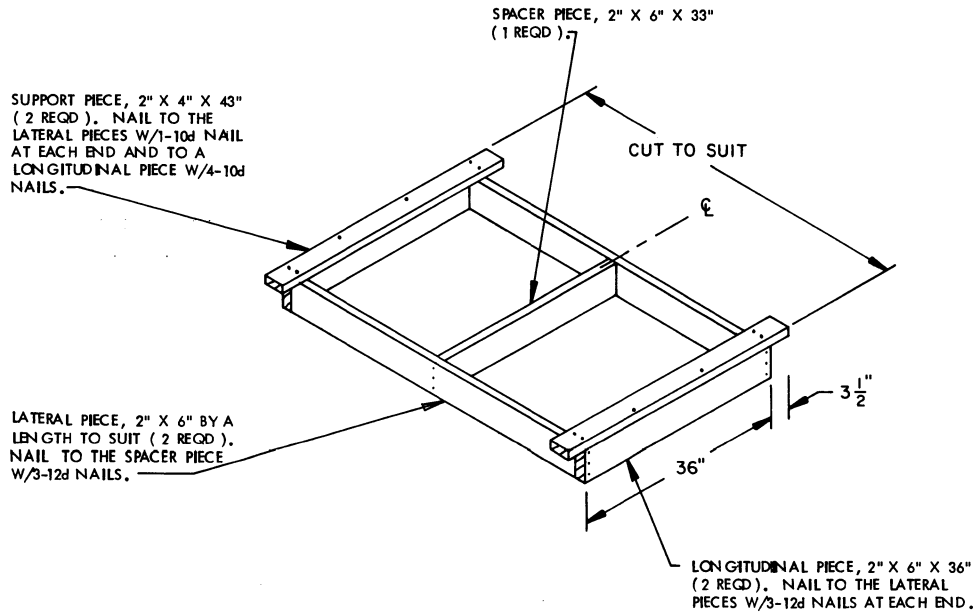
SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LCL LOAD. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE 6-LAYER AND 5-LAYER PALLET UNITS.
3. SEVEN (7) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS 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 LOAD REGARDLESS OF THE CAR LENGTH WHEN THE LOAD IS AT LEAST FOUR LOAD UNITS.
5. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑤, 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.

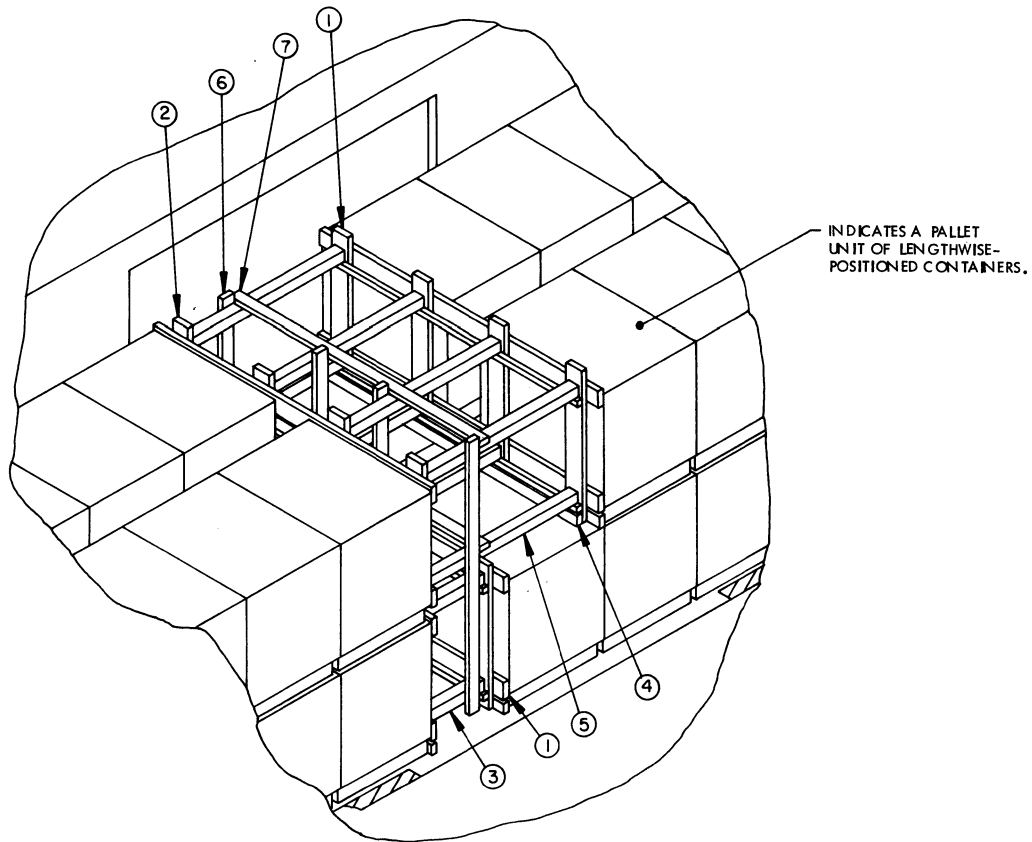
KEY NUMBERS

- 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 ④.
- ② ANTI-SWAY BRACE (3 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT ROWS OR PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE LOAD STRAPS WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79.
- ④ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "W" ON PAGE 3.
- ⑤ SPACER ASSEMBLY (2 REQD). SEE THE "SPACER ASSEMBLY C" DETAIL ON PAGE 49 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

TYPICAL LCL (7-UNIT LOAD) IN A BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES HAVING ADJUSTABLE OR FIXED WALL MEMBERS



SPACER ASSEMBLY C



ISOMETRIC VIEW

SPECIAL NOTES:

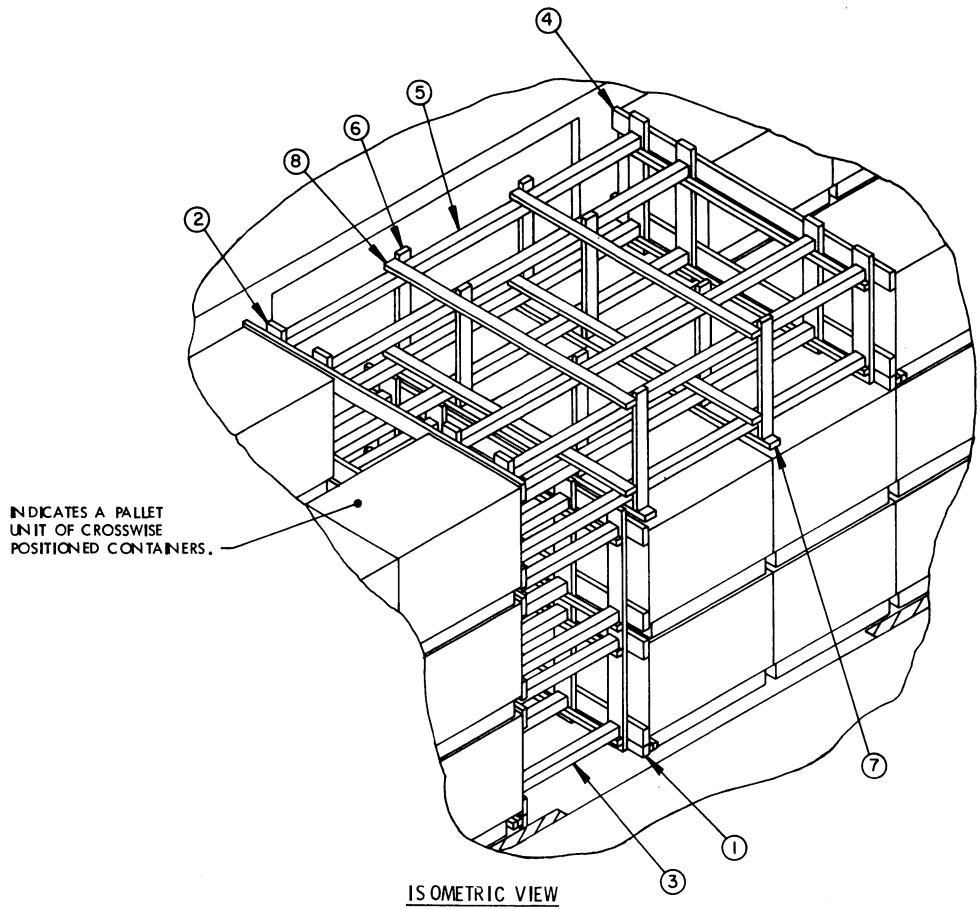
1. ONLY THE CENTER PORTION OF A 50'-6" LONG BY A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. WIDER CARS OR CARS OF OTHER LENGTHS CAN ALSO BE USED.
2. THE 6-LAYER PALLET UNIT IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM A 2-HIGH LOAD ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP ONE OR TWO LAYERS FROM A 3-HIGH LOAD.
4. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
5. CENTER GATES "B", "D" OR "F" ARE APPLICABLE FOR A LENGTHWISE-POSITIONED LOAD. THE PROPER CENTER GATE TO BE USED WILL DEPEND UPON THE UNIT BEING SHIPPED. THE QUANTITY REQUIRED FOR DUNNAGE PIECES, SUCH AS THE NUMBER OF STRUTS OR THE NUMBER OF STRUT BRACING PIECES, WILL ALSO VARY DEPENDENT UPON THE UNIT BEING LOADED. REFER TO PAGE 17 FOR DETAIL OF "CENTER GATE B" AND/OR PAGE 45 FOR DETAIL OF "CENTER GATE F".

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 31. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 AT THE LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 31.
- ③ STRUT, 4" X 4" BY CUT TO FIT (AS 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 "K", "T", AND "U" PAGES 2 AND 3.
- ④ GATE SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATE USED IN THE SECOND LAYER W/3-10d NAILS AT EACH JOINT.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (AS 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" BY CUT TO EXTEND A MINIMUM OF 2" ABOVE STRUT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" IN LENGTH (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

LENGTHWISE-POSITIONED PALLET UNITS

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



ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. THE 5-LAYER PALLET UNIT IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS FROM A 3-LAYER LOAD ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM JUST ONE (1) LOAD UNIT, OR MAY BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM A 2-LAYER LOAD.
4. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
5. THE CENTER GATES "A", "C" OR "E" ARE APPLICABLE FOR A CROSSWISE-POSITIONED LOAD. THE PROPER CENTER GATE TO BE USED WILL DEPEND UPON THE UNIT BEING SHIPPED. THE QUANTITY REQUIRED FOR DUNNAGE PIECES, SUCH AS THE NUMBER OF STRUTS OR THE NUMBER OF STRUT BRACING PIECES, WILL ALSO VARY DEPENDENT UPON THE UNIT BEING LOADED.
6. 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 (7), MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

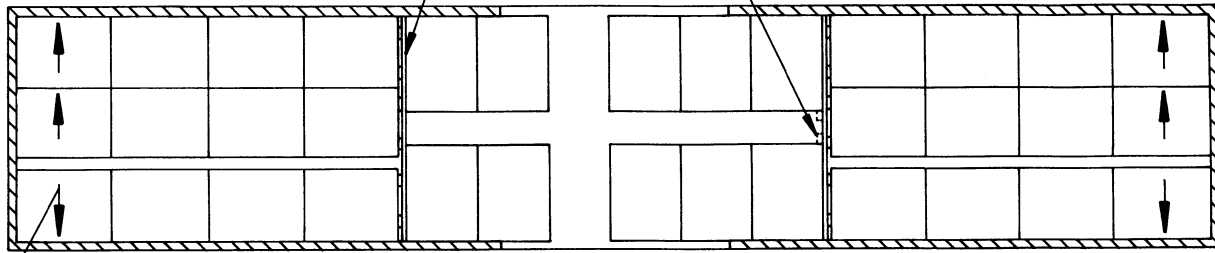
KEY NUMBERS

- (1) CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 44, SEE SPECIAL NOTE 5 AT LEFT. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- (2) CENTER GATE FOR 3-HIGH (1 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 44.
- (3) STRUT, 4" X 4" BY CUT TO FIT (16 REQD). TOENAIL TO PIECES MARKED (1) AND (2) W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U" ON PAGES 2 AND 3.
- (4) CENTER GATE FOR 1 HIGH (1 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 44.
- (5) STRUT, 4" X 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED (2) AND (4) W/2-16d NAILS AT EACH END.
- (6) VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND A MINIMUM OF 2" ABOVE THE TOP STRUT (8 REQD). NAIL TO THE STRUTS MARKED (3) W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED (7), W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 6 AT LEFT.
- (7) STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- (8) HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

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

SEPARATOR GATE (1 OR 2 REQD. AS APPLICABLE). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 53. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE CONTAINERS-CROSSWISE PALLET UNITS.

STOP PIECES, 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

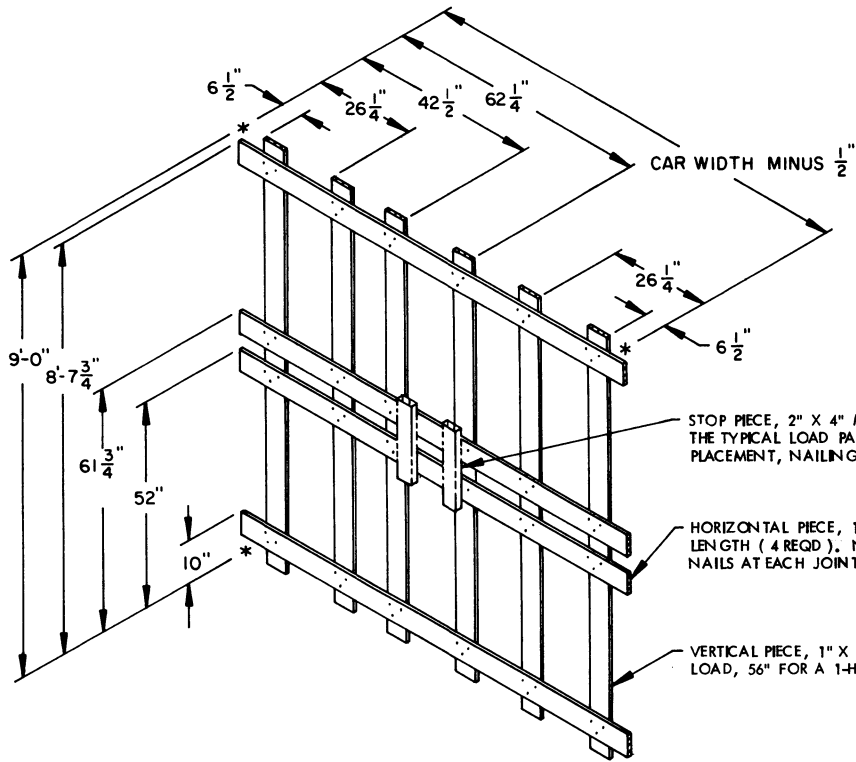
DIRECTION OF ARROW INDICATES BASE END OF CONTAINERS.

AN 8 WIDE PLUS 5 LONG LOAD IS SHOWN.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS AND LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 54 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 THE SEPARATOR GATE "A", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "A" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNIT CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE CONTAINERS-CROSSWISE UNITS OF THE LOAD.
4. THE CHART BELOW COMPARES THE VARIOUS QUANTITIES (PER LAYER) WHICH CAN BE ATTAINED AS WELL AS THE APPROXIMATE STRUT LENGTH.

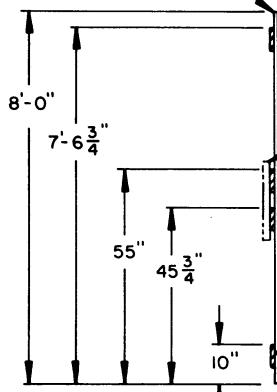
LOAD PLANNING CHART			
CAR LENGTH	UNIT PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	3-WIDE LOAD		
	27	CROSSWISE LOAD ON PAGES 8, 22, 36	43"
	26	4 WIDE AT 48-1/2" PLUS 7 LONG AT 36"	31"
	27	5 WIDE AT 48-1/2" PLUS 6 LONG AT 36"	18"
	26	6 WIDE AT 48-1/2" PLUS 4 LONG AT 36"	42"
27	7 WIDE AT 48-1/2" PLUS 3 LONG AT 36"	29"	
50'-6" CAR	36	CROSSWISE LOAD ON PAGES 8, 22, 36	18"
	32	2 WIDE AT 48-1/2" PLUS 13 LONG AT 36"	32"
	33	5 WIDE AT 48-1/2" PLUS 9 LONG AT 36"	30"
	34	8 WIDE AT 48-1/2" PLUS 5 LONG AT 36"	29"
60'-8" CAR	42	CROSSWISE LOAD ON PAGES 8, 22, 36	43"
	40	4 WIDE AT 48-1/2" PLUS 14 LONG AT 36"	21"
	40	6 WIDE AT 48-1/2" PLUS 11 LONG AT 36"	32"
	41	9 WIDE AT 48-1/2" PLUS 7 LONG AT 36"	30"
	42	12 WIDE AT 48-1/2" PLUS 3 LONG AT 36"	29"



SEPARATOR GATE A

THIS VIEW DEPICTS A SEPARATOR GATE FOR A LOAD OF 2-HIGH BASIC HEIGHT UNITS (7 LAYER). SEE THE END VIEWS BELOW FOR THE 6-LAYER AND 5-LAYER UNIT GATES.

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



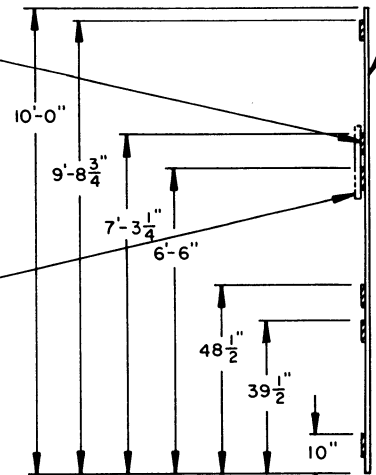
END VIEW
(6-LAYER UNIT)

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

STOP PIECE, 2" X 4" MATERIAL. SEE THE LEADERED NOTE ON THE TYPICAL LOAD PATTERN PLAN VIEW ON PAGE 52 FOR PLACEMENT, NAILING AND OTHER GUIDANCE.

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

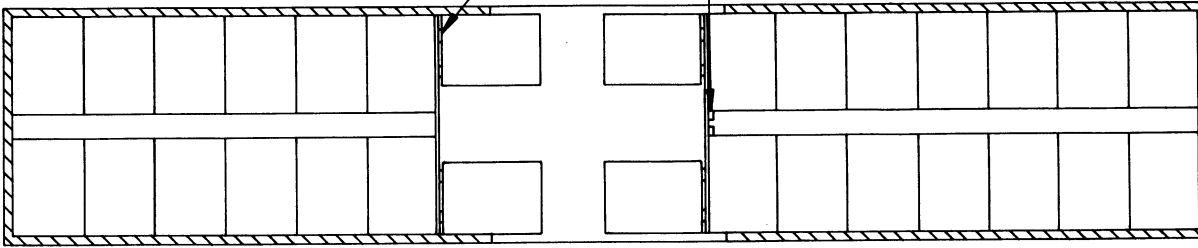
VERTICAL PIECE, 1" X 6" X 10'-0" FOR A 3-HIGH LOAD, 6'-10" FOR A 2-HIGH LOAD, 44" FOR A 1-HIGH LOAD (6 REQD).



END VIEW
(5-LAYER UNIT)

SEPARATOR GATE (1 OR 2 REQD, AS APPLICABLE). SEE THE "SEPARATOR GATE B" DETAIL ON PAGE 55. 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

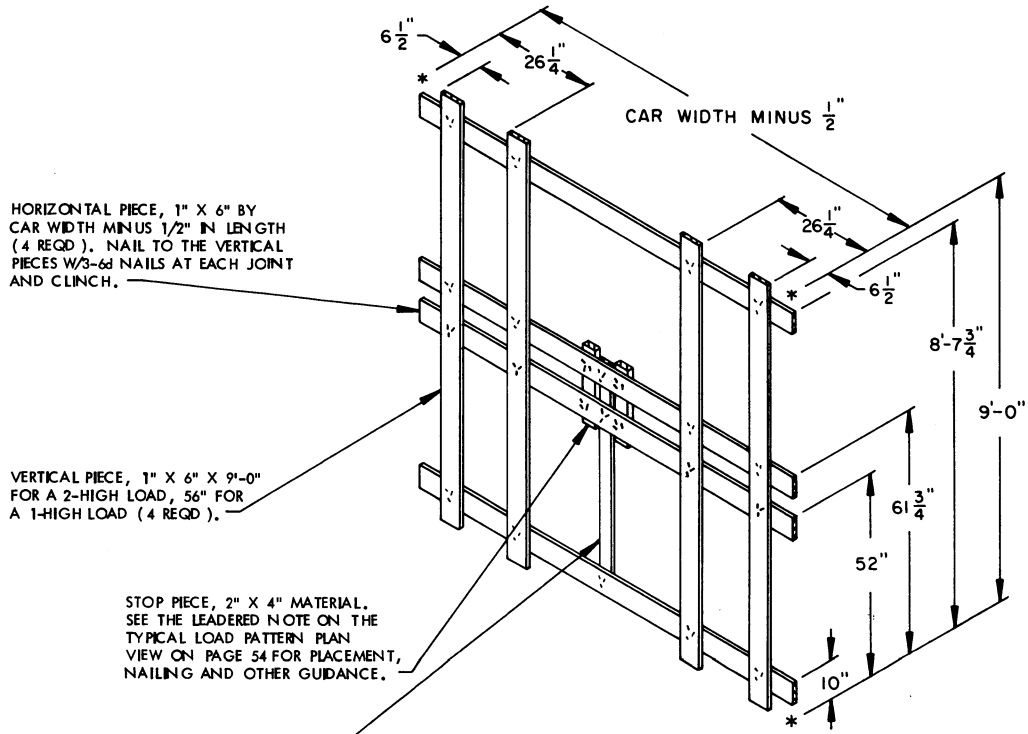
A 13 LONG PLUS 2 WIDE LOAD IS SHOWN.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED.
2. THE PROCEDURES ON THIS PAGE AND ON PAGE 52 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OTHER METHOD OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN INCLUDING THE DEPICTED ICL PROCEDURES.
3. THE BLOCKING AND BRACING FOR THE COMBINATION LOAD, OTHER THAN THE 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 UNIT CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE CONTAINERS-CROSSWISE UNITS OF THE LOAD.
4. THE CHART BELOW COMPARES THE VARIOUS QUANTITIES (PER LAYER) WHICH CAN BE ATTAINED AS WELL AS THE APPROXIMATE STRUT LENGTH.

LOAD PLANNING CHART

CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	24	LENGTHWISE LOAD ON PAGES 10, 24, 38	48"
	22	7 LONG AT 36" PLUS 4 WIDE AT 48-1/2"	31"
	20	4 LONG AT 36" PLUS 6 WIDE AT 48-1/2"	42"
	20	3 LONG AT 36" PLUS 7 WIDE AT 48-1/2"	29"
50'-6" CAR	32	LENGTHWISE LOAD ON PAGES 10, 24, 38	24"
	30	13 LONG AT 36" PLUS 2 WIDE AT 48-1/2"	32"
	28	9 LONG AT 36" PLUS 5 WIDE AT 48-1/2"	30"
	26	6 LONG AT 36" PLUS 7 WIDE AT 48-1/2"	41"
24	2 LONG AT 36" PLUS 10 WIDE AT 48-1/2"	40"	
60'-8" CAR	38	LENGTHWISE LOAD ON PAGES 10, 24, 38	38"
	36	15 LONG AT 36" PLUS 3 WIDE AT 48-1/2"	33"
	34	11 LONG AT 36" PLUS 6 WIDE AT 48-1/2"	32"
	32	7 LONG AT 36" PLUS 9 WIDE AT 48-1/2"	30"
30	3 LONG AT 36" PLUS 12 WIDE AT 48-1/2"	29"	



SEPARATOR GATE B

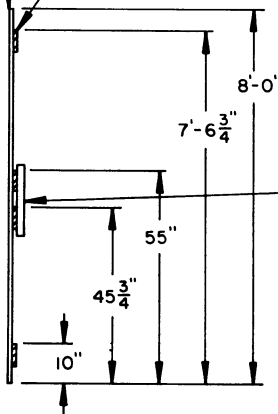
ANTI-SWAY BRACE STOP PIECE, 1" X 4" BY A LENGTH TO SUIT. NAIL TO THE HORIZONTAL PIECES W/3-6d NAILS AT EACH JOINT AND CLINCH.

THIS VIEW DEPICTS A SEPARATOR GATE FOR A LOAD OF 2-HIGH BASIC HEIGHT UNITS (7-LAYER) POSITIONED LENGTHWISE. SEE THE END VIEWS BELOW FOR THE 6-LAYER AND 5-LAYER UNIT GATES.

VERTICAL PIECE, 1" X 6" X 8'-0" FOR A 2-HIGH LOAD, 48" FOR A 1-HIGH LOAD (4 REQD).

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

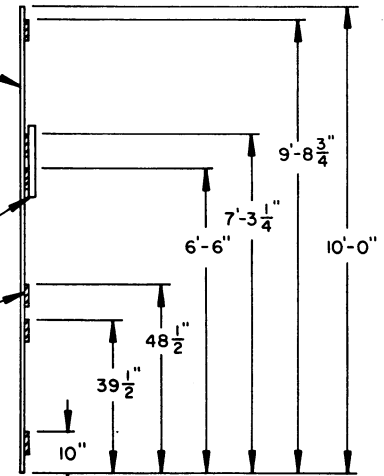
VERTICAL PIECE, 1" X 6" X 10'-0" FOR A 3-HIGH LOAD, 6'-10" FOR A 2-HIGH LOAD, 44" FOR A 1-HIGH LOAD (4 REQD).



END VIEW
(6-LAYER UNIT)

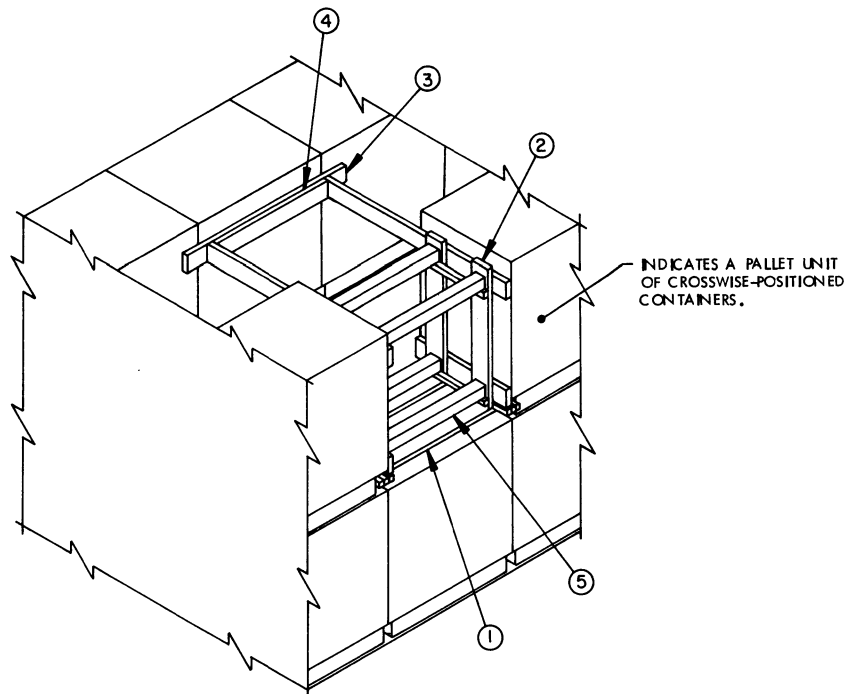
STOP PIECE, 2" X 4" MATERIAL. SEE THE LEADERED NOTE ON THE TYPICAL LOAD PATTERN PLAN VIEW ON PAGE 54 FOR PLACEMENT, NAILING AND OTHER GUIDANCE.

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



END VIEW
(5-LAYER UNIT)

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



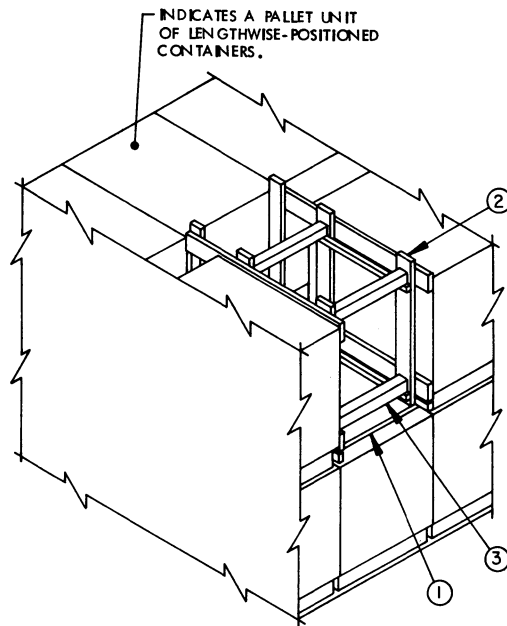
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP TIER OF A 2-TIER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-TIER PALLET UNIT FROM A 3-TIER LOAD WHEN LOADING THE BASIC HEIGHT DECREASED TWO LAYERS PALLET UNIT.
4. 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.
5. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
6. IF THE DEPICTED PALLET UNIT OMITTED PROCEDURES ARE TO BE EMPLOYED IN A 3-WIDE LOAD, PIECES MARKED ③ AND ④ WILL NOT BE USED. REFER TO SPECIAL NOTE 4 ON PAGE 58 FOR ADDITIONAL MODIFICATIONS.

KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 48-1/2" (2 REQD). POSITION SO AS TO BE UNDER THE 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 APPLICABLE DETAIL ON PAGE 58. NAIL TO THE FILLER PIECE, PIECE MARKED ④, W/3-10d NAILS. 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 ANTI-SWAY BEARING PIECE, 2" X 6" X 60" (1 REQD). SEE SPECIAL NOTE 6.
- ④ FILLER PIECE, 2" X 6" X 45-1/2" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ③, W/5-10d NAILS.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 42-1/2") (4 REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.



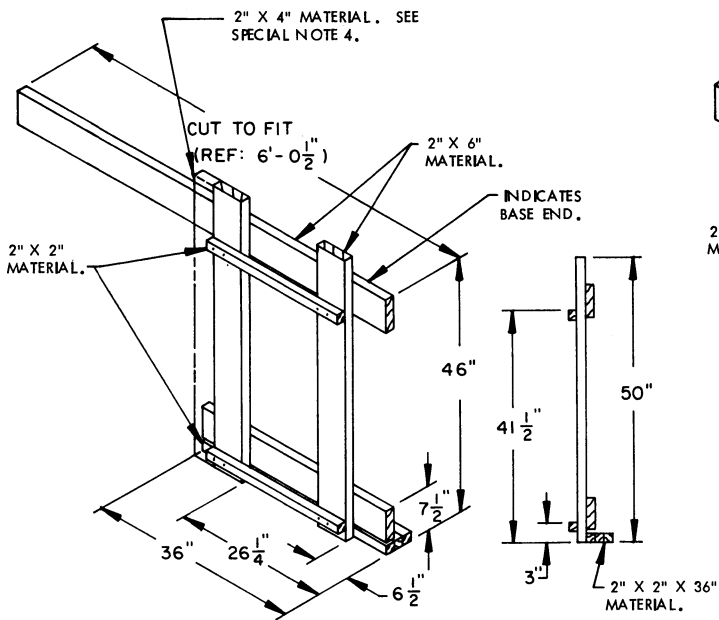
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP TIER OF A 2-TIER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP-TIER PALLET UNIT FROM A 3-TIER LOAD WHEN LOADING THE BASIC HEIGHT DECREASED TWO LAYERS PALLET UNIT.
4. THE OMITTED-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
5. ONLY THE BLOCKING AND BRACING FOR THE OMITTED UNIT IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

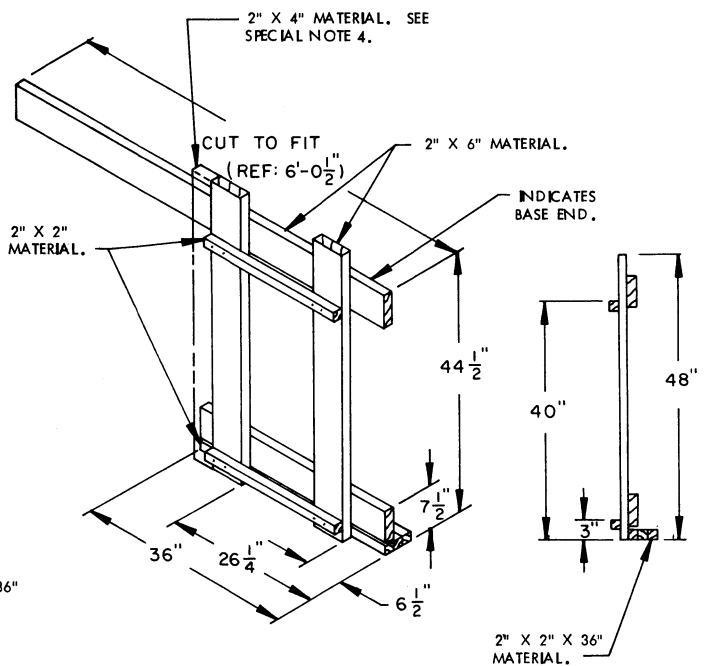
KEY NUMBERS

- (1) SUPPORT PIECE, 2" X 6" X 36" (2 REQD). POSITION SO AS TO BE UNDER THE END 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 APPLICABLE DETAIL ON PAGE 59. 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" BY CUT TO FIT (REF: 30") (4 REQD). TOENAIL TO PIECE MARKED (2) W/2-16d NAILS AT EACH END.



LOAD BEARING GATE A

THIS GATE IS FOR USE IN A LOAD OF BASIC HEIGHT UNITS (7-LAYER). SEE SPECIAL NOTE 3 AT RIGHT FOR NAILING GUIDANCE.

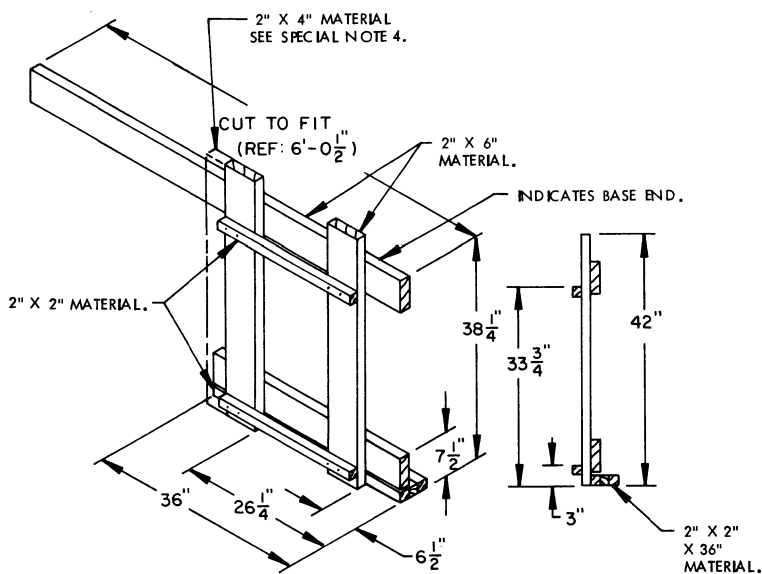


LOAD BEARING GATE B

THIS GATE IS FOR USE IN A LOAD OF 6-LAYER UNITS PALLET UNITS. SEE SPECIAL NOTE 3 BELOW FOR NAILING GUIDANCE.

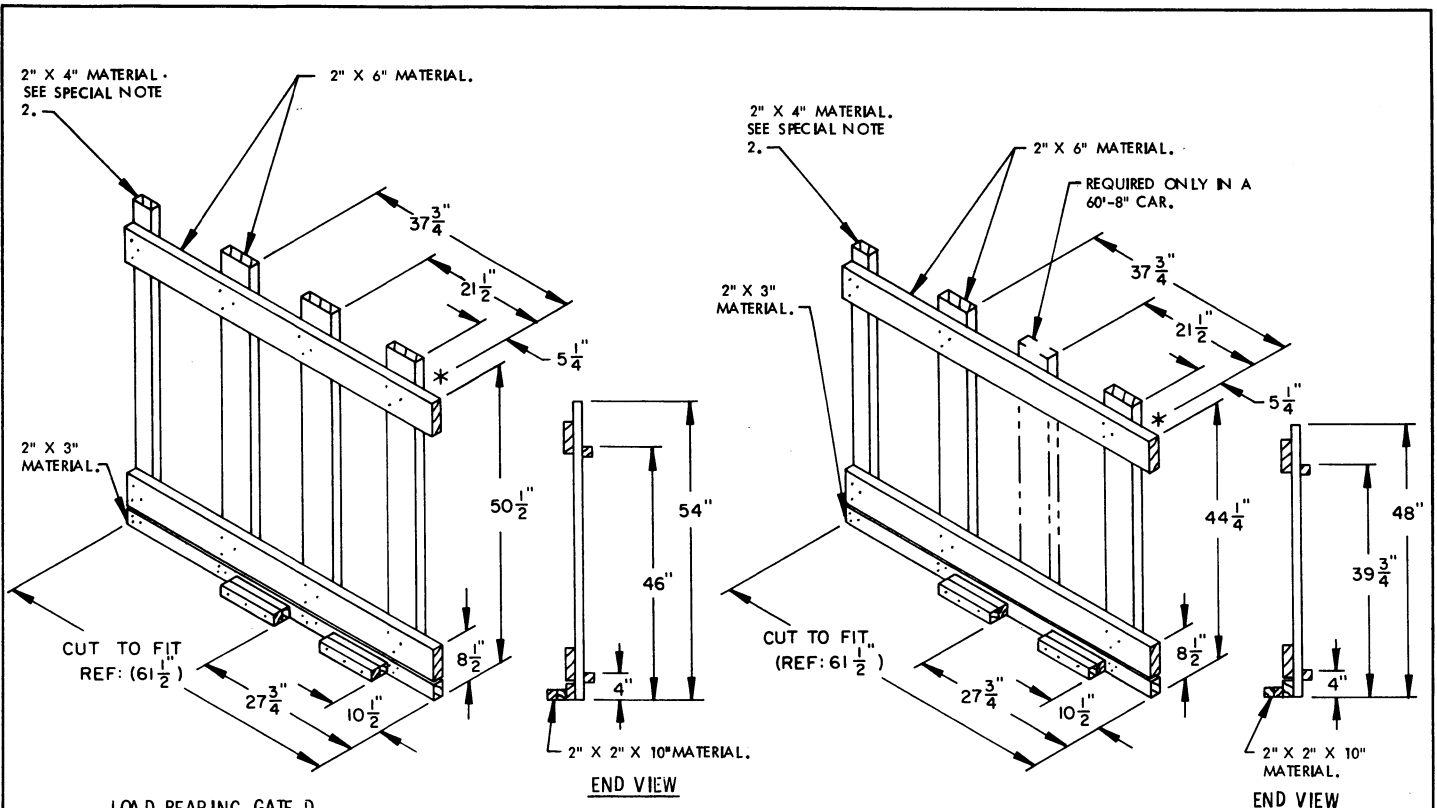
SPECIAL NOTES:

1. THE GATES SHOWN ON THIS PAGE ARE FOR USE IN THE LCL PROCEDURES SHOWN ON PAGE 56. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CONTAINERS-CROSSWISE PALLET UNITS.
2. THE REFERENCE DIMENSIONS GIVEN FOR THE CUT-TO-FIT PIECES ARE BASED ON AN INSIDE CAR WIDTH OF 9'-2". THESE DIMENSIONS WILL HAVE TO BE ADJUSTED WHEN LOADING CARS OF OTHER WIDTHS FOR A 2-WIDE LOAD. **NOTE:** WHEN THE PALLET UNITS ARE LOADED 3-WIDE ACROSS A CAR, THE TOP AND BOTTOM HORIZONTAL PIECES WILL BE CUT-TO-FIT AGAINST THE LATERALLY ADJACENT PALLET UNITS. THE LENGTH OF THESE PIECES WILL NEED TO BE ADJUSTED ACCORDING TO THE WIDTH OF THE CAR.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 2" HORIZONTAL PIECE TO THE 2" X 6" VERTICAL PIECES W/2-10d NAILS AT EACH JOINT AND NAIL THE 2" X 6" HORIZONTAL PIECES TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 2" GATE HOLD DOWN PIECES TO THE 2" X 2" HORIZONTAL PIECE W/4-10d NAILS EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.
4. IF THE PALLET UNIT OMITTED PROCEDURES ON PAGE 56 ARE TO BE EMPLOYED IN A 3-WIDE LOAD, THE PROCEDURES MUST BE MODIFIED. PIECES MARKED ③ AND ④ ON THAT PAGE WILL NOT BE USED AND THE TOP HORIZONTAL PIECE OF EACH LOAD BEARING GATE WILL BE 36" LONG IN LIEU OF CUT TO FIT, TO PROVIDE A BEARING SURFACE TO CONTACT THE CRIB FILL OF A LOAD, IF USED, OR TO BETTER CONTACT THE ADJACENT PALLET UNIT IF CRIB FILL IS NOT USED, A VERTICAL PIECE MUST BE ADDED TO EACH GATE. THIS PIECE WILL BE 2" X 4" MATERIAL OF A LENGTH TO MATCH THE LENGTH OF THE 2" X 6" VERTICAL PIECES OF THE GATE.



LOAD BEARING GATE C

THIS GATE IS FOR USE IN A LOAD OF DECREASED 5-LAYER UNITS. SEE SPECIAL NOTE 3 ABOVE FOR NAILING GUIDANCE.

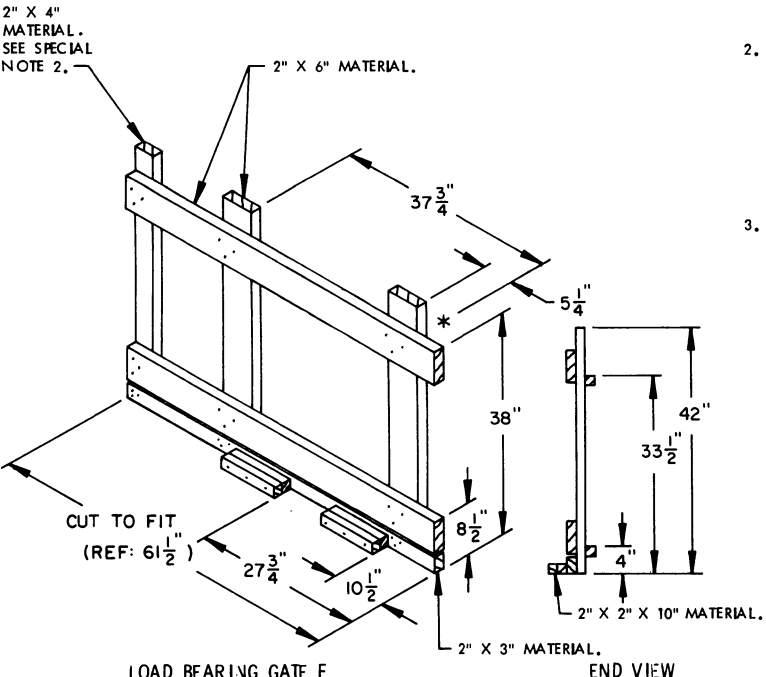


LOAD BEARING GATE D

THIS GATE IS FOR USE IN A LOAD OF BASIC HEIGHT UNITS (7 LAYER). SEE SPECIAL NOTE 3 AT RIGHT FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT GATE REQUIRED. A LEFT HAND GATE IS SHOWN.

LOAD BEARING GATE E

THIS GATE IS FOR USE IN A LOAD OF 6-LAYER UNITS. SEE SPECIAL NOTE 3 BELOW FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.

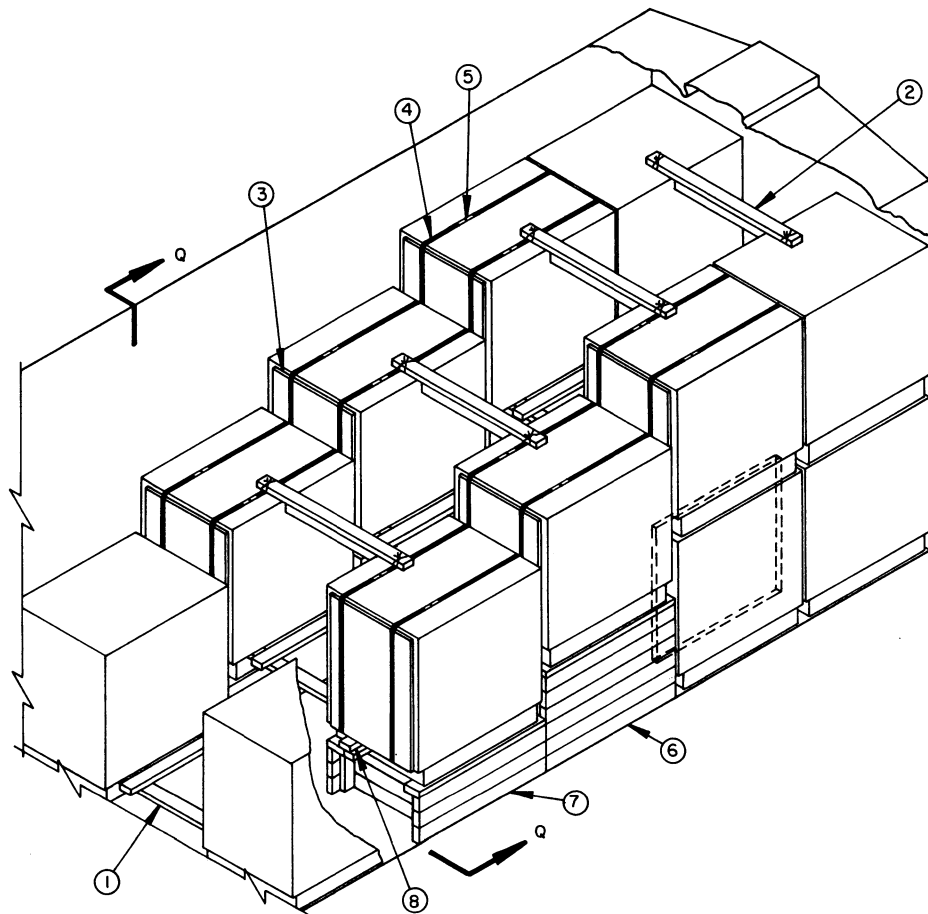


LOAD BEARING GATE F

THIS GATE IS FOR USE IN A LOAD OF 5-LAYER UNITS. SEE SPECIAL NOTE 3 AT RIGHT FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.

SPECIAL NOTES:

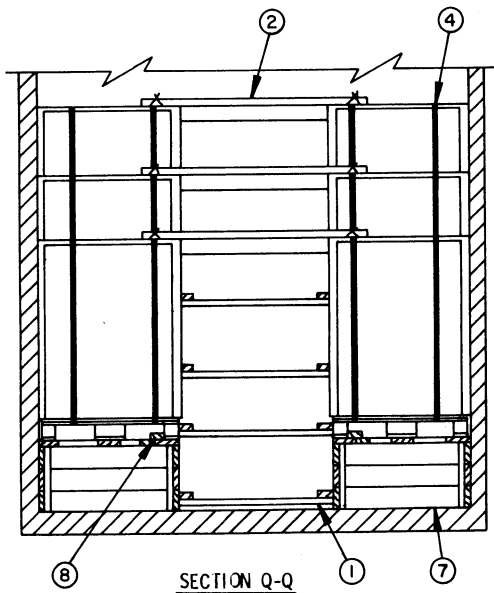
1. THE GATES SHOWN ON THIS PAGE ARE FOR USE IN THE ICL PROCEDURES SHOWN ON PAGE 57. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CONTAINERS-LENGTHWISE PALLET UNITS.
2. THE REFERENCE DIMENSION GIVEN FOR THE CUT-TO-FIT PIECES IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". IF THE CAR BEING USED IS WIDER THAN 9'-2", DELETE THE 2" X 4" VERTICAL PIECE, EXTEND THE TOP HORIZONTAL PIECE TO FILL THE VOID MINUS 1-1/2". THE LOWER 2" X 6" HORIZONTAL PIECE AND THE 2" X 3" HORIZONTAL PIECE WILL BE 48-1/2". A 2" X 6" X 48" ANTI-SWAY BRACE BEARING PIECE, AND A 2" X 6" X 33" FILLER PIECE, SIMILAR TO PIECES MARKED ③ AND ④ IN THE PARTIAL VIEW ON PAGE 56, WILL ALSO BE REQUIRED. USE THE NAILING INSTRUCTIONS IN KEY NUMBERS ② AND ④ ON PAGE 56 GUIDANCE.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 3" OR 2" X 6" HORIZONTAL PIECE (5) TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 2" GATE HOLD DOWN PIECES TO A HORIZONTAL PIECE W/2-10d NAILS EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



ISOMETRIC VIEW

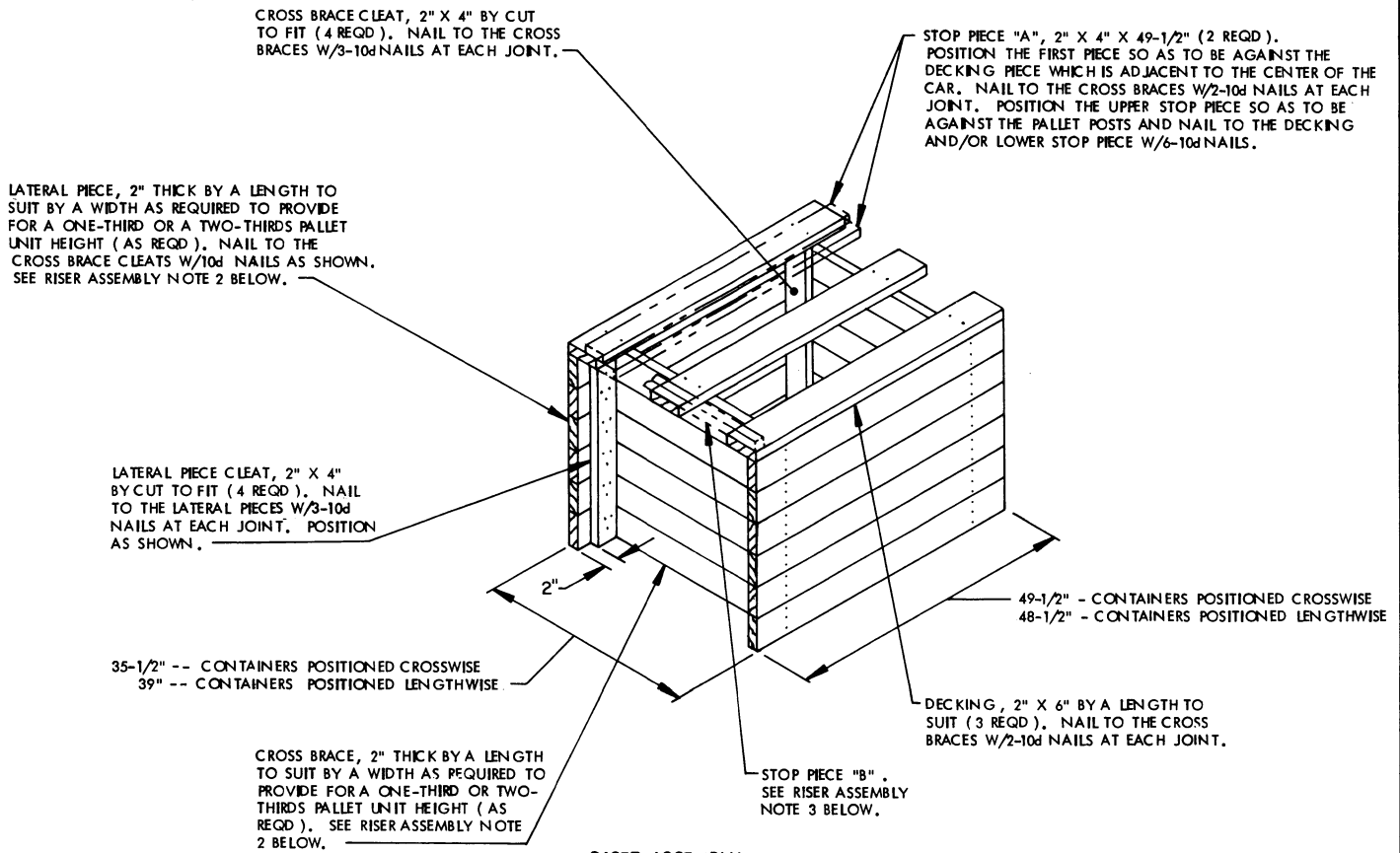
KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 61.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79.
- ③ SIDE FILL ASSEMBLY (16 REQD/2 PER PALLET UNIT UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 62. SEE SPECIAL NOTE 6 ON PAGE 61.
- ④ REINFORCING STRAP, 1-1/4" X .035" X OR .031" X 18'-0" LONG (REF) STEEL STRAPPING (16 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE SIDE FILL ASSEMBLIES. SECURE TO THE SIDE FILL ASSEMBLIES WITH STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 62.
- ⑤ SEAL FOR 1-1/4" STRAPPING (32 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" 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 61.
- 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 61.
- ⑧ STOP PIECE "A" (4 REQD). SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 61.



SECTION Q-Q

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING



RISER ASSEMBLY

SPECIAL NOTES FOR LOAD:

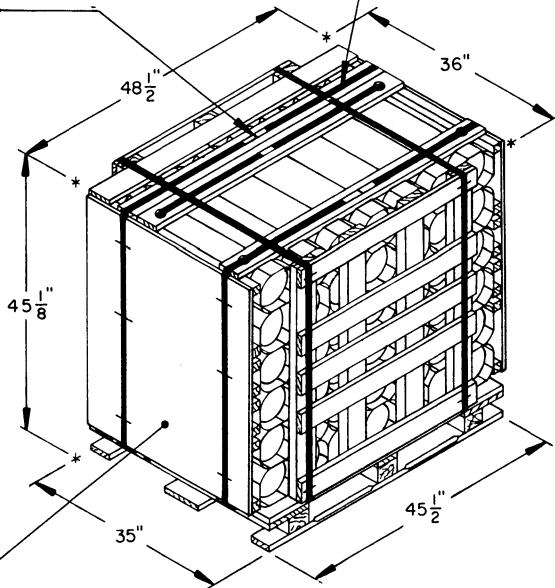
1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD ON PAGE 60. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER HEIGHT UNITS COVERED BY THIS DOCUMENT.
3. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE CONTAINERS POSITIONED CROSSWISE IN THE CAR. WITH MODIFICATIONS, THE PROCEDURES ARE ALSO APPLICABLE FOR LENGTHWISE POSITIONED CONTAINERS. SEE SPECIAL NOTES 5 AND 6.
4. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. ANTI-SWAY BRACE "A" IS APPLICABLE FOR ALL LOADS WITH THE CONTAINERS POSITIONED CROSSWISE. USE ANTI-SWAY BRACE "B", AS DETAILED ON PAGE 17, FOR ALL LOADS WITH CONTAINERS POSITIONED LENGTHWISE.
6. FOR PALLET UNITS WITH THE CONTAINERS POSITIONED LENGTHWISE, PLY-WOOD SIDE FILL ASSEMBLIES, SHOWN AS PIECE MARKED ③, WILL NOT BE REQUIRED. STRAPPING BOARDS AS SHOWN IN THE METHOD "B" DETAIL ON PAGE 62 WILL BE USED. STOP PIECE "B" WILL BE USED IN LIEU OF STOP PIECE "A", WHEN THE CONTAINERS ARE POSITIONED LENGTHWISE.

SPECIAL NOTES FOR RISER ASSEMBLY:

1. THE TYPICAL RISER ASSEMBLY SHOWN ABOVE IS FOR THE BASIC HEIGHT UNIT (7-LAYER). THE HEIGHT OF THE BASIC UNIT IS 51-3/4". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER ⑥ IN THE LOAD ON PAGE 60. FABRICATE FROM SIX (6) PIECES OF 2" X 6" MATERIAL TO PROVIDE A TOTAL HEIGHT OF 34-1/2" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER ⑦, WILL BE FABRICATED FROM THREE (3) PIECES OF 2" X 6" MATERIAL FOR THE CROSS BRACES AND FOR THE LATERAL PIECES FOR A TOTAL HEIGHT OF 18".
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL/CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE PALLET UNIT BEING LOADED AND THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. NOTE: 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 CONTAINERS ARE POSITIONED CROSSWISE IN THE CAR, AS SHOWN IN THE LCL LOAD ON PAGE 60. IF THE CONTAINERS ARE POSITIONED LENGTHWISE IN THE CAR, POSITION A 2" X 2" BY A LENGTH TO SUIT PIECE ACROSS THE DECKING, ON THE END WHICH IS AGAINST THE CAR SIDEWALL, AND NAIL TO THE DECKING W/2-10d NAILS AT EACH JOINT. SEE STOP PIECE "B" ON THE RISER ASSEMBLY ABOVE FOR LOCATION GUIDANCE.

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

REINFORCING STRAP, 1-1/4" X .035" OR .031" X 18'-0" LONG STEEL STRAPPING FOR 7-LAYER UNITS, 16'-6" FOR 6-LAYER UNITS, 15'-6" FOR 5-LAYER UNITS (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND SIDE FILL. SECURE TO THE SIDE FILL W/STAPLES.

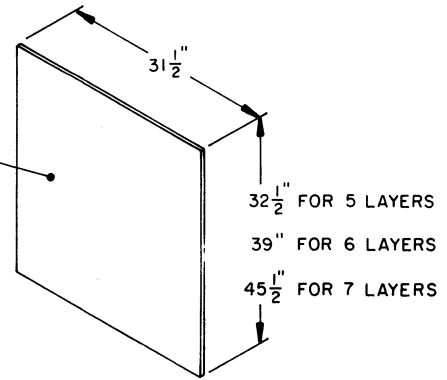


SIDE FILL (2 REQD). SEE THE DETAIL AT RIGHT.

METHOD A

FOR ALL UNITS. THE 6-LAYER UNIT IS SHOWN.

PLYWOOD, 1/2" BY A WIDTH TO SUIT X 31-1/2".

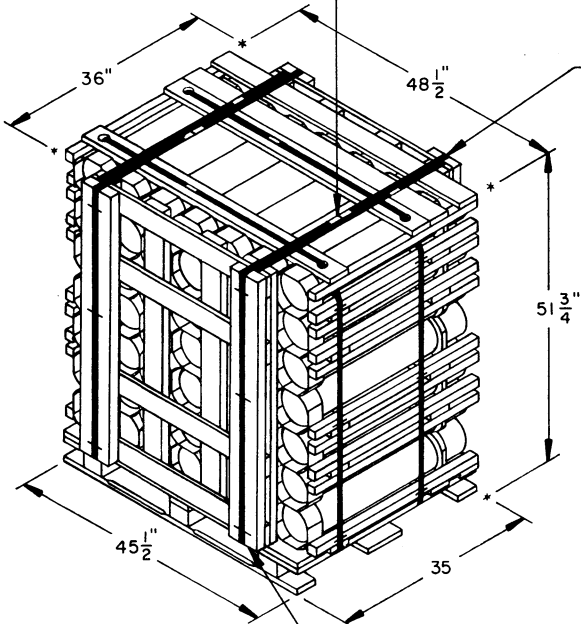


SIDE FILL

FOR METHOD "A" ABOVE

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

REINFORCING STRAP, 1-1/4" X .035" OR .031" X 16'-0" LONG STEEL STRAPPING FOR 7-LAYER UNITS, 15'-0" FOR 6-LAYER UNITS, 14'-0" FOR 5-LAYER UNITS (2 REQD). INSTALL TO ENCIRCLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO EACH STRAPPING BOARD W/3 STAPLES.

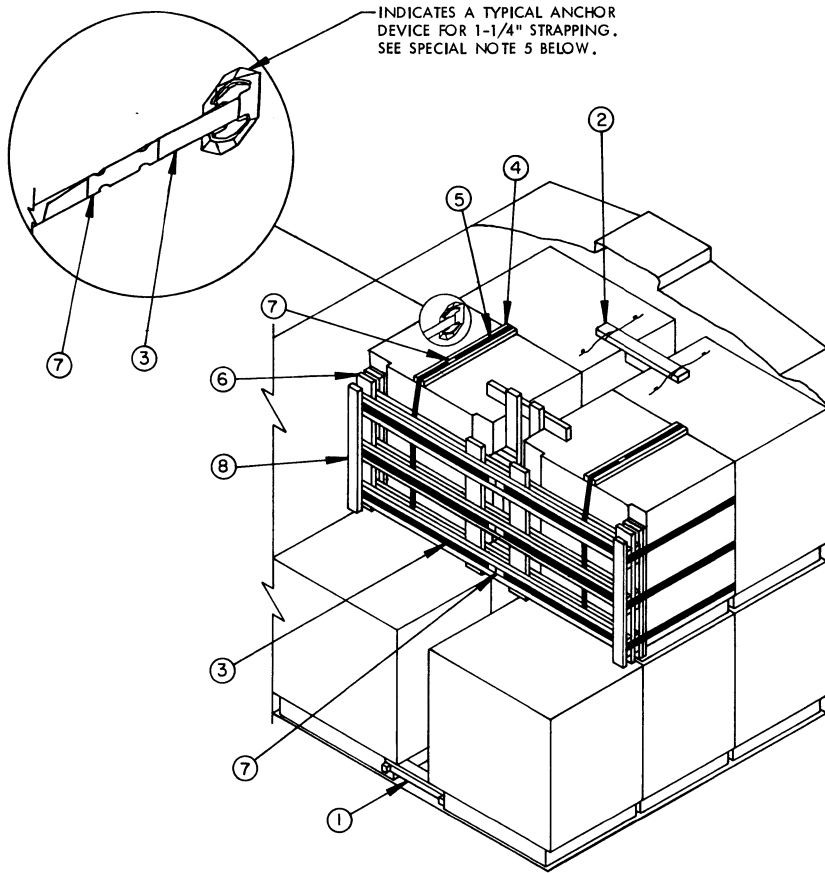


METHOD B

FOR ALL PALLET UNITS. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN.

STRAPPING BOARD, 2" X 6" X 45-1/2" FOR 7-LAYER UNITS, 2" X 6" X 39" FOR 6-LAYER UNITS AND 33" FOR 5-LAYER UNITS (4 REQD). POSITION AS SHOWN.

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ISOMETRIC VIEW

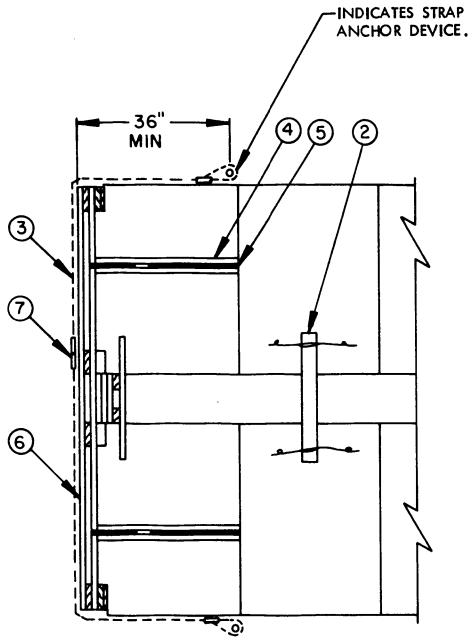
KEY NUMBERS

SPECIAL NOTES:

1. A 9'-2" WIDE ALL-METAL BOXCAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LCL LOAD. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED PALLET UNITS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED PALLET UNITS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.
4. A BULKHEAD GATE USED IN CONJUNCTION WITH THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 7,500 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 5,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS. SEE THE "MAXIMUM NUMBER OF UNITS" CHART BELOW FOR GUIDANCE IN THE QUANTITIES OF THE PALLET UNITS COVERED BY THIS DOCUMENT WHICH CAN BE RETAINED USING THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING.
5. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST THIRTY-SIX INCHES (36") TOWARD THE CAR END WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE. IF THE ANCHOR DEVICES IN THE CAR BEING LOADED ARE NOT LOCATED NEAR ENOUGH TO THE END OF THE CAR SO THAT THE 36" REQUIREMENT CAN BE SATISFIED, IT WILL BE NECESSARY TO INSTALL GATES AND STRUTS AT THE END OF THE CAR. THESE GATES WILL BE 1-HIGH GATES FOR THE ITEM BEING LOADED AND WILL BE INSTALLED SIMILAR TO THE STRUTTED GATE METHOD SHOWN ON PAGE 50 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 57 FOR A SINGLE UNIT.
6. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH 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 65 FOR THE LOCATION OF THE STRAPPING BOARDS IN RELATION TO THE LOCATION OF THE HORIZONTAL PIECES. THE STRAPPING BOARDS SHOULD BE LOCATED WITHIN THESE TOLERANCES. IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.

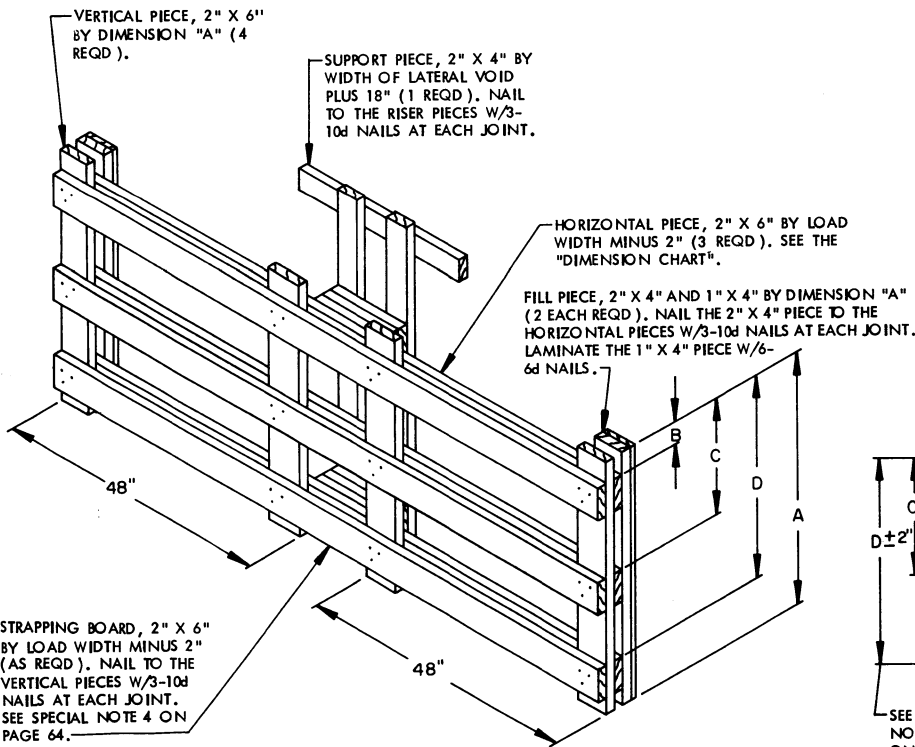
- ① ANTI-SWAY BRACE (5 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "L" AND "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 17. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE "TIE WIRE APPLICATION B" DETAIL ON PAGE 79.
- ③ BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. ATTACH TO AN ANCHOR WITH 1 SEAL. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 65 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.
- ④ STRAPPING BOARD 2" X 4" X 36" (2 REQD).
- ⑤ BUNDLING STRAP, 1-1/4" X .035" X 16'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT, THE HORIZONTAL PIECES OF THE BULKHEAD GATE, AND A STRAPPING BOARD, PIECE MARKED ④. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ③.
- ⑥ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 65. SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ SEAL FOR 1-1/4" STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED ③, AND 1 PER BUNDLING STRAP, PIECE MARKED ⑤). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "N" ON PAGE 2.
- ⑧ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-1/2" NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

MAXIMUM NUMBER OF UNITS			
NO. OF STRAPS	7-LAYER UNIT	6-LAYER UNIT	5-LAYER UNIT
3	5	6	7
2	3	4	4

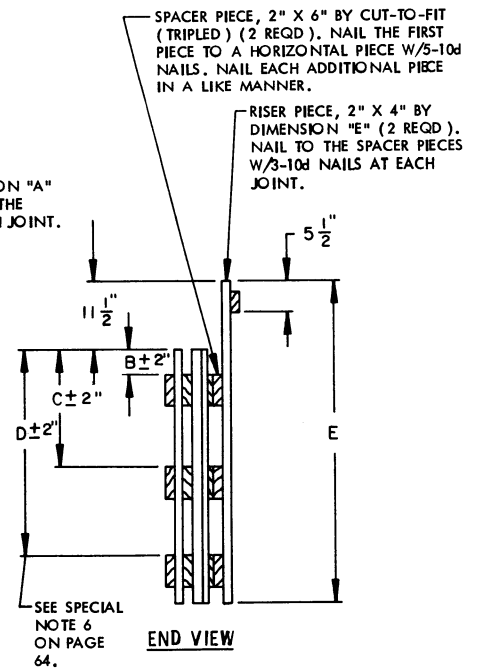


STRAP APPLICATION PLAN VIEW

DIMENSION CHART					
UNIT	DIM A	DIM B	DIM C	DIM D	DIM E
BASIC HEIGHT UNIT 7-LAYER	44"	4" ± 1-1/2"	23-1/4" ± 1-1/2"	35" ± 1-1/2"	55-1/2"
6-LAYER	36"	4" ± 1-1/2"	17" ± 1-1/2"	28" ± 1-1/2"	48-1/2"
5-LAYER	29-1/2"	4" ± 1-1/2"	11" ± 1-1/2"	21-1/2" ± 1-1/2"	42"



BULKHEAD GATE

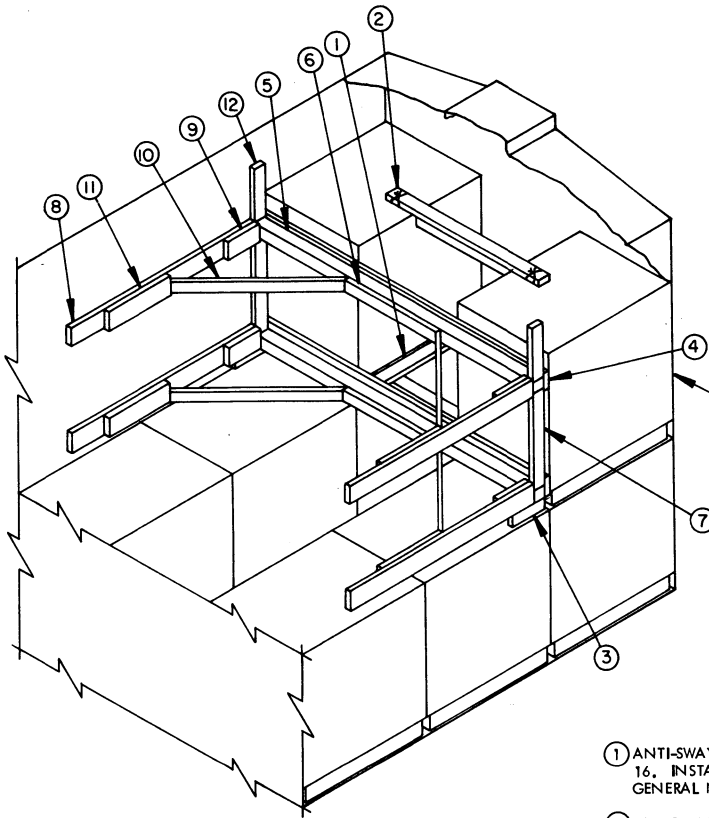


END VIEW

(SPECIAL NOTES CONTINUED)

ADJACENT PIECE MARKED (8) 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 (8) 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 (8) IS DOUBLED.

6. THE CENTER CLEAT, SHOWN AS PIECE MARKED (6), WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", 38" LONG FOR A 9'-4" WIDE CAR, AND 40" LONG FOR A 9'-6" WIDE CAR.



IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 79.

KEY NUMBERS

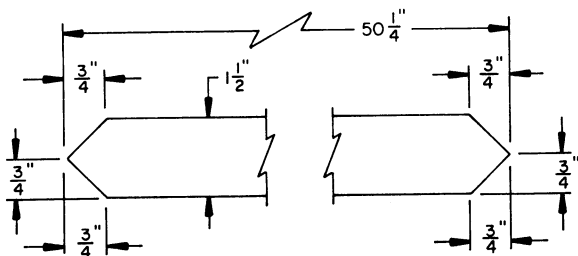
- (1) ANTI-SWAY BRACE (AS REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- (2) TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79.
- (3) SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 5 AT LEFT.
- (4) HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED (5), W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.
- (5) CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).
- (6) CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED (5), W/7-16d NAILS. SEE SPECIAL NOTE 6 ABOVE.
- (7) SPACER CLEAT, 2" X 4" X 33" FOR 7-LAYER UNITS, 31-1/2" FOR 6-LAYER UNITS, 25" FOR 5-LAYER UNITS. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. REFER TO THE DIMENSIONS IN KEY NUMBER (2) ON PAGE 67 FOR A CONTAINERS-LENGTHWISE LOAD. TWO (2) SPACER CLEATS ARE REQUIRED.
- (8) HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- (9) POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (8), W/4-16d NAILS.
- (10) 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 (5), AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (8), W/2-16d NAILS AT EACH END.
- (11) BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED (8), W/8-16d NAILS.
- (12) HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

ISOMETRIC VIEW

- 1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
- 2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LCL LOAD. THE DEPICTED PROCEDURES, IN EITHER A 2-WIDE OR 3-WIDE LOAD, ARE APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
- 3. PARTIAL-LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CARLOADS DEPICTED HEREIN. A CONTAINERS-CROSSWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CONTAINERS-LENGTHWISE LOADS, SUCH AS THE TYPE OF ANTI-SWAY BRACE, PIECE MARKED (1), AND THE LENGTH OF THE SPACER CLEAT, PIECE MARKED (7).
- 4. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER, IN A 2-WIDE OR 3-WIDE LOAD, BE IT A SECOND TIER, THIRD TIER (IF APPLICABLE), OR FIRST. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. THIS WILL BE NOT MORE THAN FOUR (4) 7-LAYER UNITS, SIX (6) 6-LAYER UNITS, OR SIX (6) 5-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGE 67, 68, AND 69 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
- 5. 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 (3), (4), (5), (7), (9), AND (12) MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED (10) TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE

(CONTINUED AT RIGHT ABOVE)

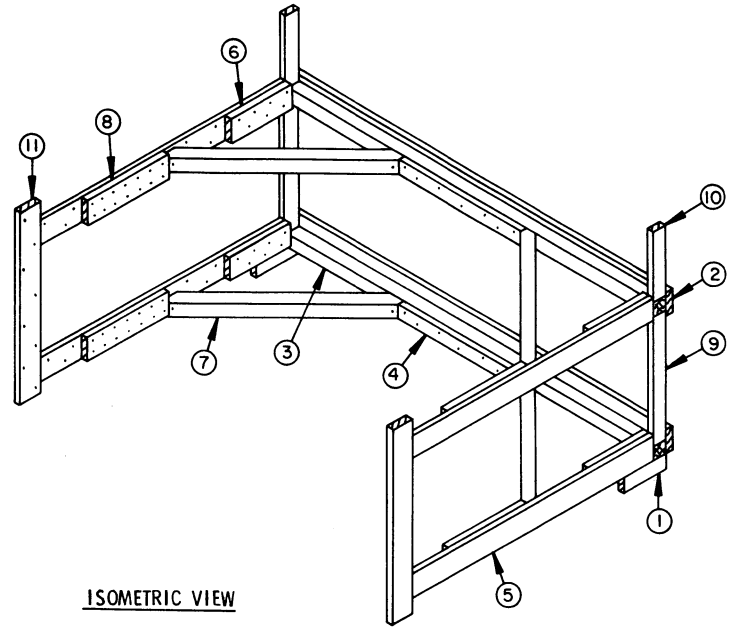


DIAGONAL BRACE

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

SPECIAL NOTES:

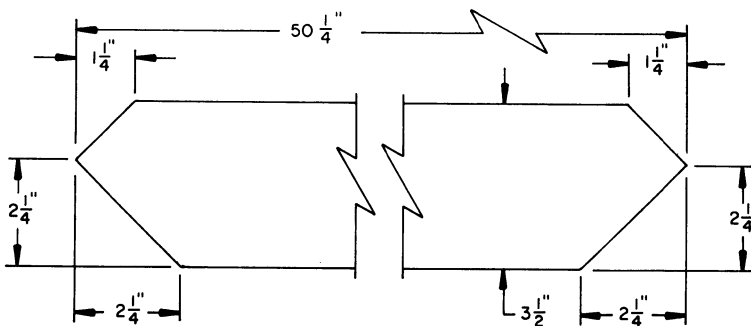
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN NINE (9) 7-LAYER UNITS (3 WIDE), TEN (10) 6-LAYER UNITS (2 WIDE), OR TWELVE (12) 5-LAYER UNITS. IF THE CONTAINERS ARE POSITIONED CONTAINERS-CROSSWISE, THREE PALLET UNITS CAN BE LOADED ACROSS THE CAR. SEE PAGES 8, 22, OR 36 FOR GUIDANCE. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 68 AND 69 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 66 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 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 A 9'-2", 38" LONG FOR A 9'-4" WIDE CAR, AND 40" LONG FOR A 9'-6" WIDE CAR.
4. REFER TO PAGE 66 FOR TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

KEY NUMBERS

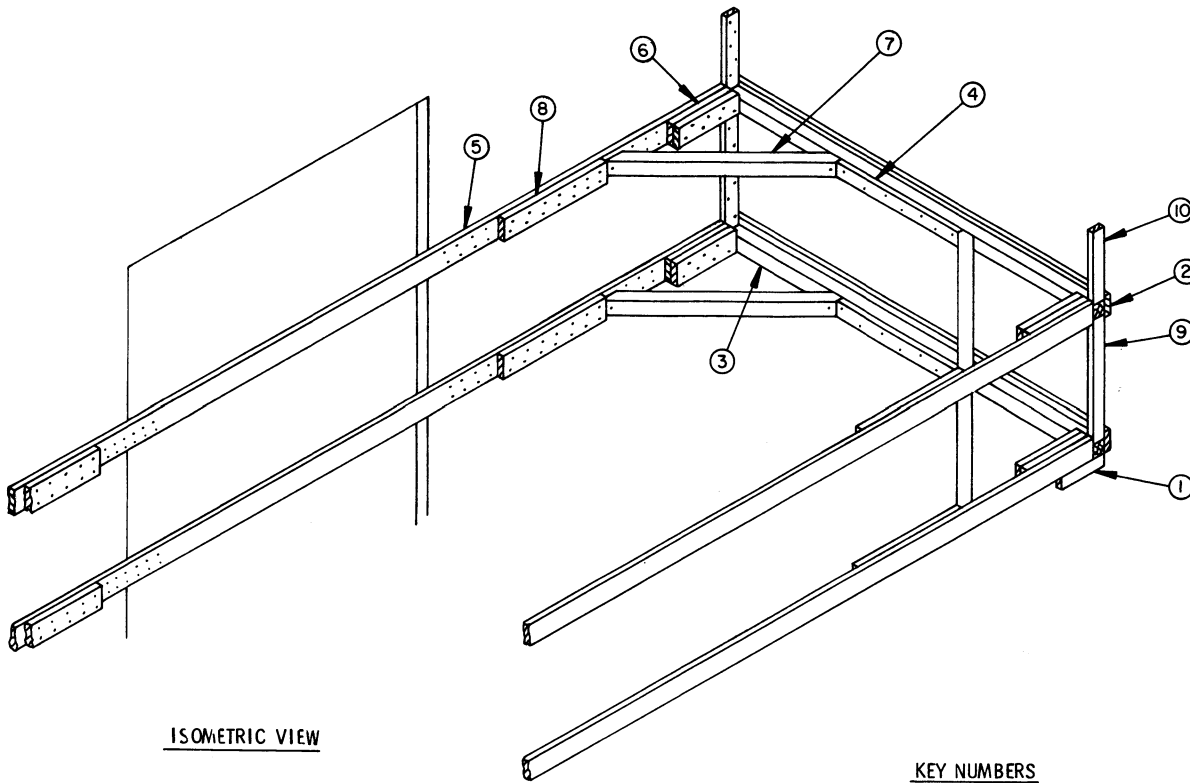
- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION AS SHOWN, 1" ABOVE THE LOWER PALLET UNITS AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 4" X 72" (2 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 36-1/2" FOR 7-LAYER UNITS, 30-1/4" FOR 6-LAYER UNITS, 24" FOR 5-LAYER UNITS. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. REFER TO THE DIMENSIONS ON PAGES 66, 68, OR 69 FOR A CROSSWISE LOAD.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

TYPE "B" K-BRACE



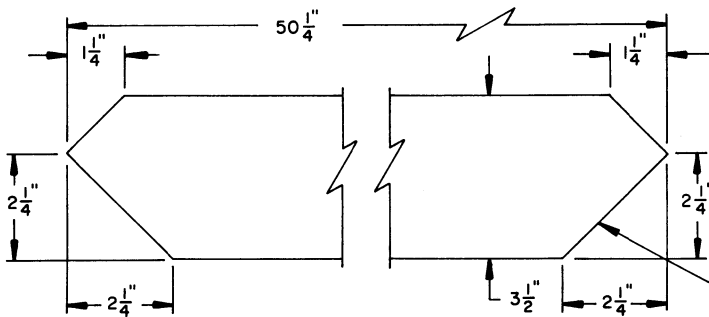
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN TWELVE (12) 7-LAYER UNITS, FIFTEEN (15) 6-LAYER UNITS (3 WIDE) OR EIGHTEEN (18) 5-LAYER UNITS. IF THE CONTAINERS ARE POSITIONED CROSSWISE, THREE PALLET UNITS CAN BE LOADED ACROSS THE CAR. SEE PAGES 8, 22, OR 36 FOR GUIDANCE. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 69 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 67 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 66 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", 38" LONG FOR A 9'-4" WIDE CAR, AND 40" FOR A 9'-6" CAR.
4. **CAUTION:** A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

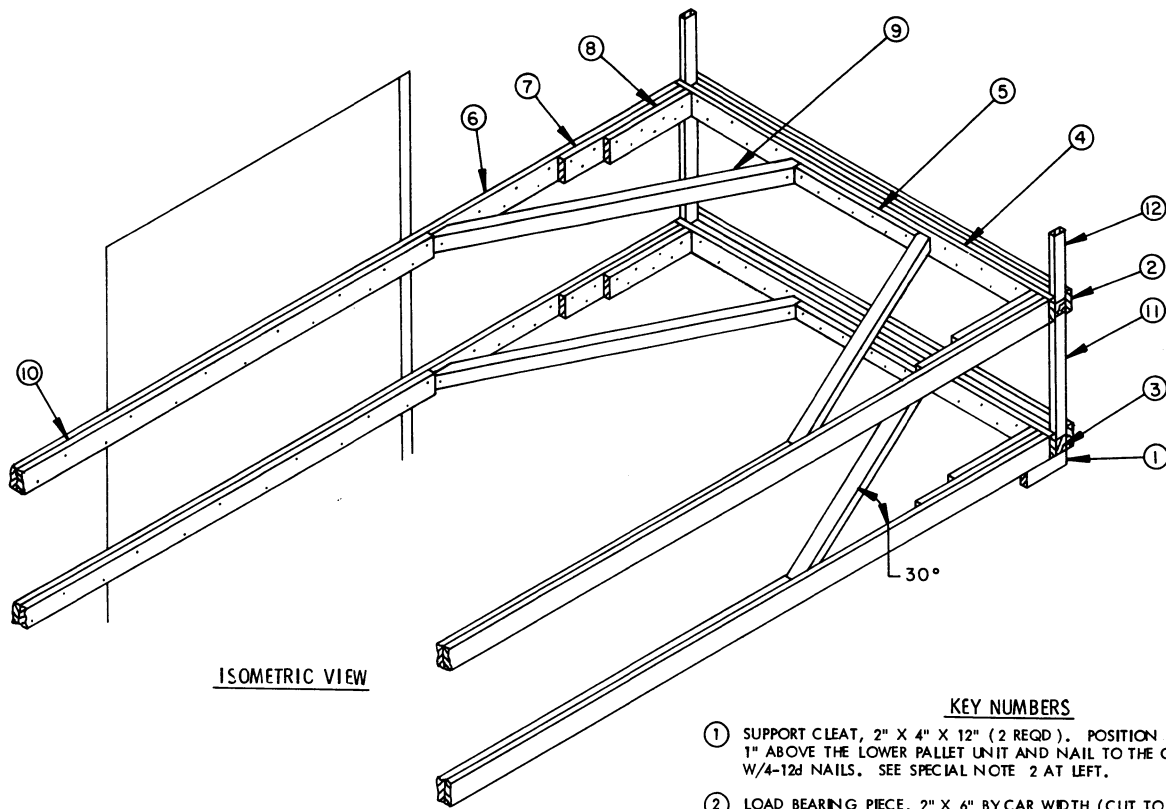
- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION AS SHOWN 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ③ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A "LIKE MANNER".
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 4" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 33" FOR 7-LAYER UNITS, 31-1/2" FOR 6-LAYER UNITS, 25" FOR 5-LAYER UNITS. NAIL TO THE CAR SIDEWALL W/4-12d NAILS. REFER TO THE DIMENSIONS IN KEY NUMBER ⑨ ON PAGE 67 FOR A LENGTHWISE LOAD.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



DIAGONAL BRACE

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.

SEE SPECIAL NOTE 2 ABOVE.



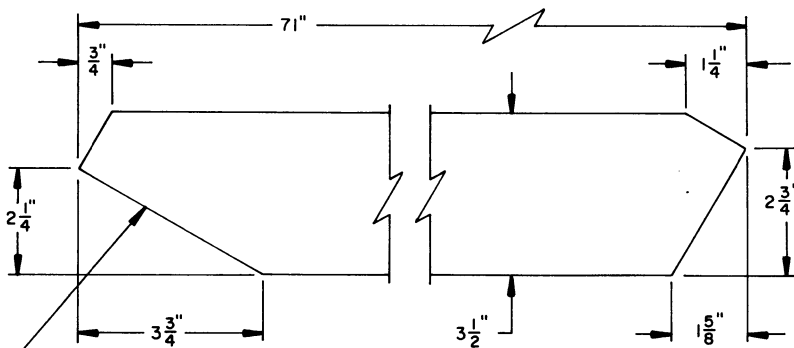
ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 12" (2 REQD). POSITION AS SHOWN, 1" ABOVE THE LOWER PALLET UNIT AND NAIL TO THE CAR SIDEWALL W/4-12d NAILS. 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 "L" AND "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 4" 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 33" FOR 7-LAYER UNITS, 31-1/2" FOR 6-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS. REFER TO THE DIMENSIONS ON PAGE 67 FOR A LENGTHWISE LOAD.
- ⑫ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W5-12d NAILS.

SPECIAL NOTES:

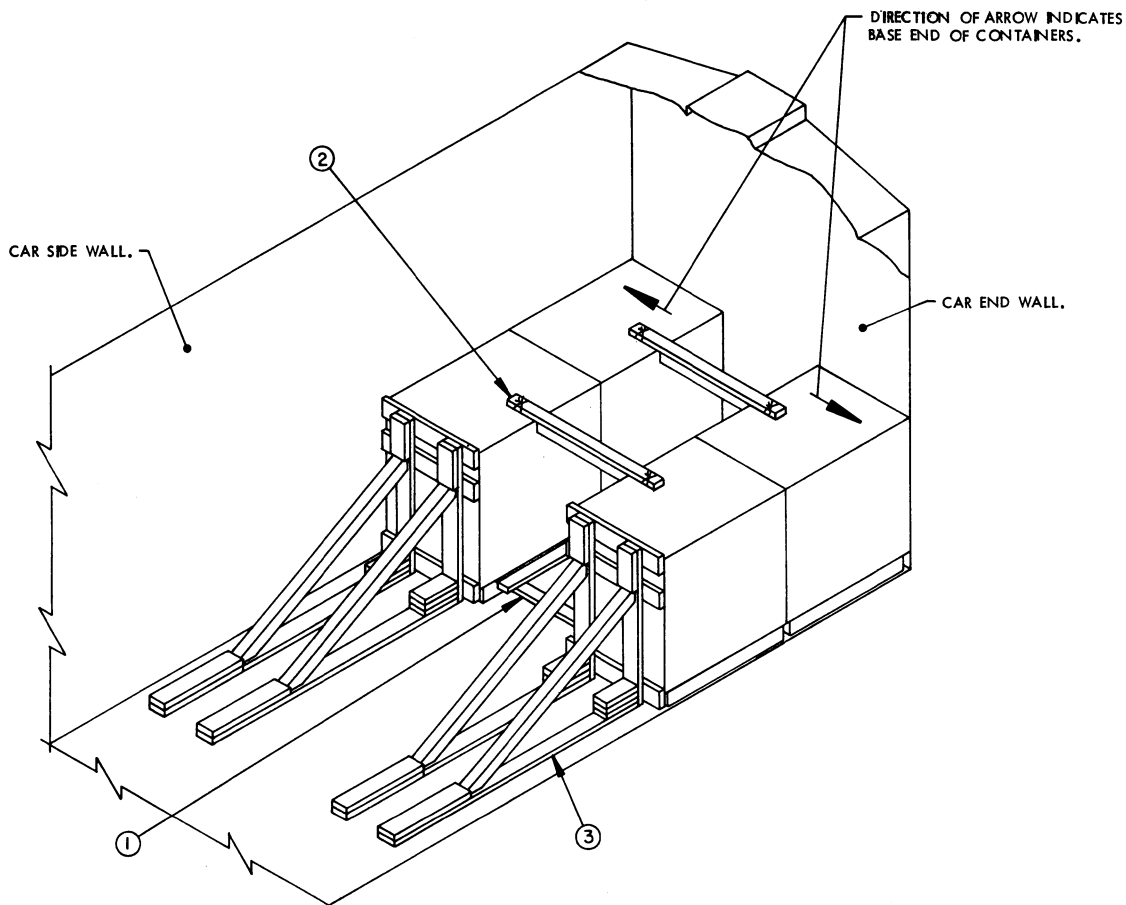
1. THE TYPE "D" K-BRACE IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN SIXTEEN (16) 7-LAYER UNITS, EIGHTEEN (18) 6-LAYER UNITS, OR TWENTY-TWO (22) 5-LAYER UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 68 MAY BE USED. FOR A PARTIAL TIER OF 8,000 TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 67 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 66 WILL BE ADEQUATE.
2. CAUTION: SOME CARS ARE NOT SUITED FOR APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE OF THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS THAT PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2" AND 38" LONG FOR A 9'-4" AND 40" LONG FOR A 9'-6" WIDE CAR.
4. CAUTION: A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



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

DIAGONAL BRACE
SEE SPECIAL NOTE 2 ABOVE.

TYPE "D" K-BRACE

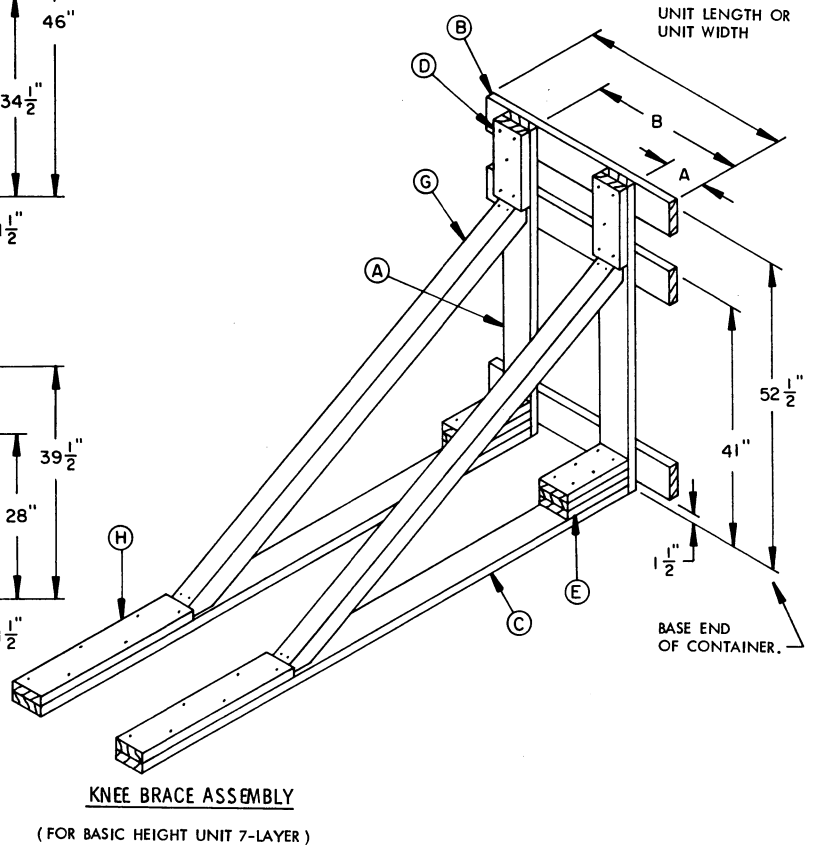
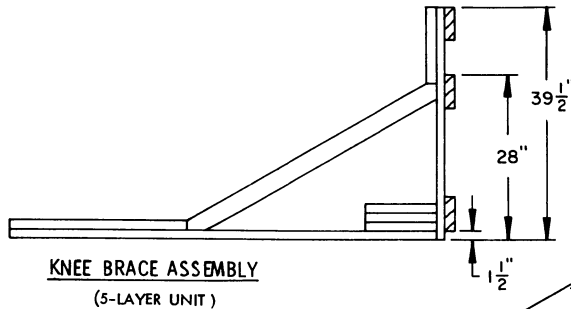
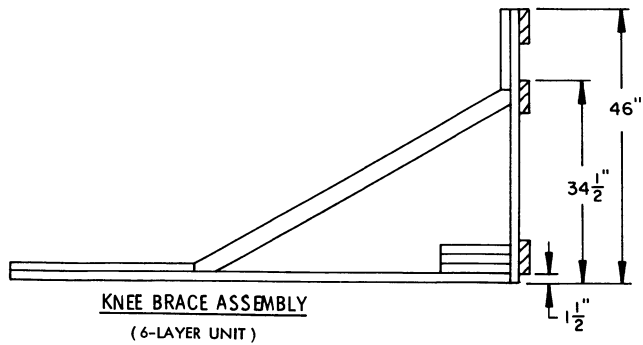


SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 4 ARE NOT EXCEEDED. ALSO, THE LOAD MAY CONSIST OF THREE ROWS OF CROSSWISE POSITIONED UNITS OR TWO ROWS OF LENGTHWISE POSITIONED UNITS. REFER TO THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 17 FOR LENGTHWISE UNITS. WHEN THE "ANTI-SWAY BRACE B" ASSEMBLY IS USED, THE BOTTOM HORIZONTAL PIECE OF EACH KNEE BRACE ASSEMBLY WILL NEED TO BE EXTENDED THREE (3") TOWARD THE CENTER TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE.
4. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF PALLET UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS.
5. HOLD-DOWN CLEAT (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 DETAILS SPECIFIED ELSEWHERE. REFER TO THE "CENTER GATE A" DETAIL ON PAGE 16 FOR A CONTAINERS-CROSSWISE ROW AND THE "CENTER GATE B" DETAIL ON PAGE 17 FOR A CONTAINERS - LENGTHWISE ROW.

KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 16. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE DETAIL ON PAGE 17. WIRE TIE TO THE CROSS PIECE OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 79.
- ③ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 71 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.

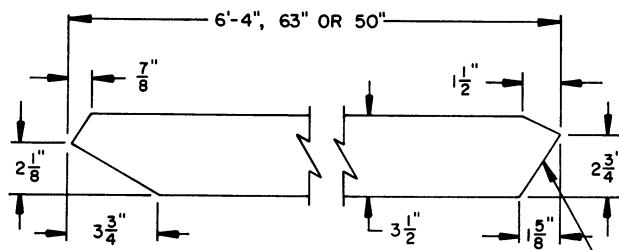


VERTICAL PIECE PLACEMENT CHART		
	DIM A	DIM B
CONTAINERS CROSSWISE	6-1/2" *	26-1/4"
CONTAINERS LENGTHWISE	5-1/4"	37-3/4"

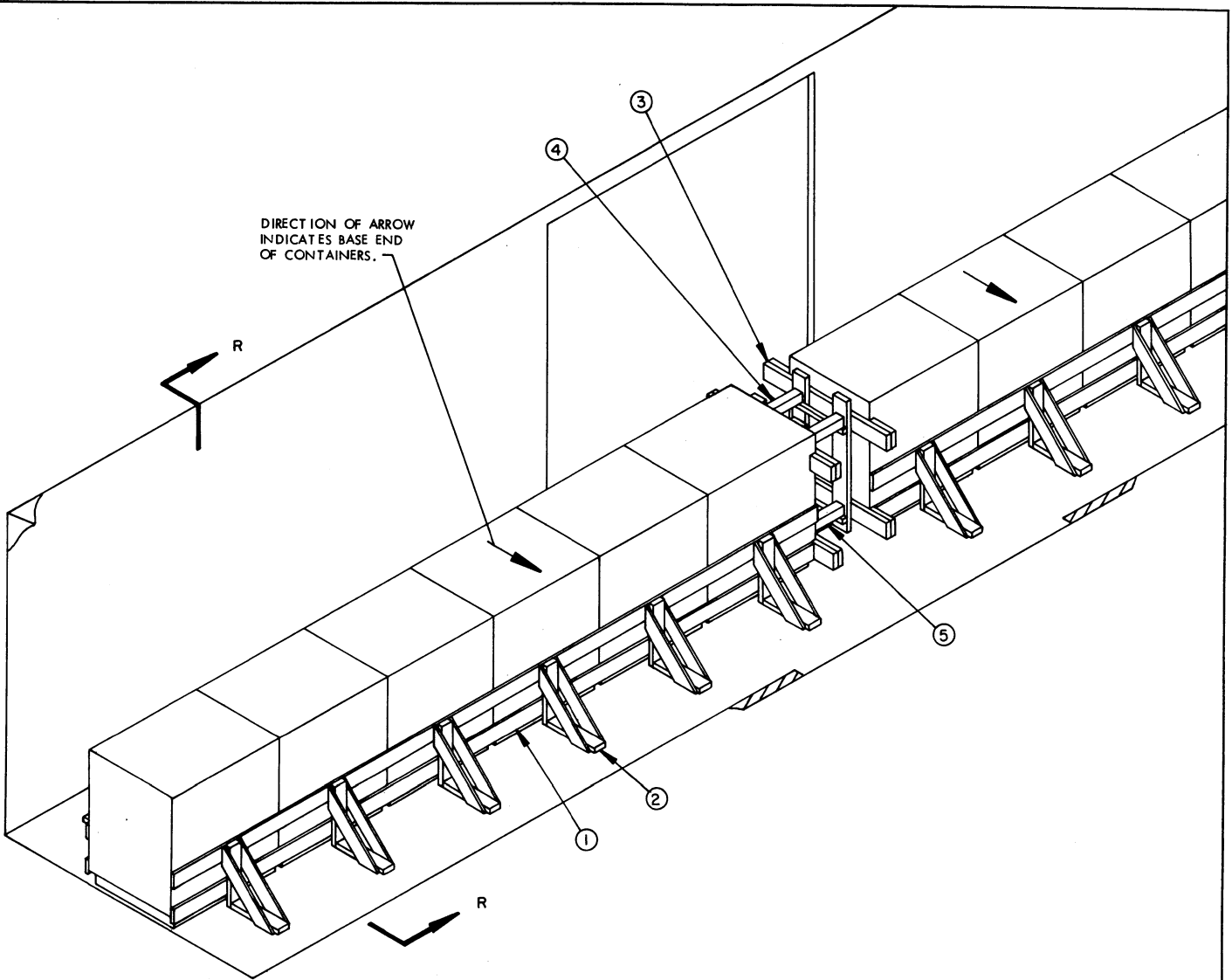
* BASE END OF CONTAINER POSITIONED AGAINST SIDE WALL OF CAR.

KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" X 52-1/2" (2 REQD). SEE THE CHART AT LEFT FOR PLACEMENT DIMENSIONS.
- (B) HORIZONTAL PIECE, 2" X 6" BY PALLET UNIT LENGTH OR WIDTH (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 70.
- (C) FLOOR CLEAT, 2" X 6" X 8'-1" FOR 7-LAYER UNITS, 2" X 6" X 7'-1" FOR 6-LAYER UNITS, OR 2" X 6" X 6'-2" FOR 5-LAYER UNITS (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "R" ON PAGE 2.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 13" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (E) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (C), W/4-16d NAILS. NAIL THE SECOND AND THIRD PIECES IN A LIKE MANNER AND TOENAIL THE THIRD PIECE TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS.
- (F) BRACE, 4" X 4" X 6'-4" FOR 7-LAYER UNITS, 4" X 4" X 63" FOR 6-LAYER UNITS, OR 4" X 4" X 50" FOR 5-LAYER UNITS (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 5 ON PAGE 70.



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

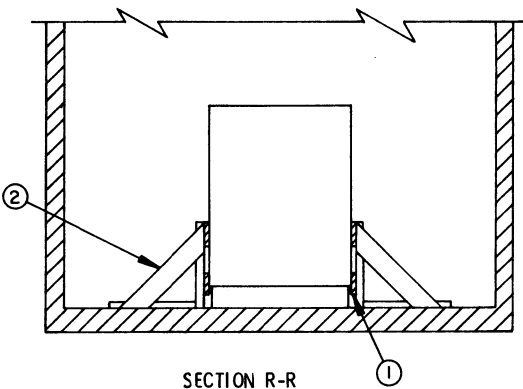


DIRECTION OF ARROW
INDICATES BASE END
OF CONTAINERS.

ISOMETRIC VIEW

KEY NUMBERS

- ① HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (AS 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 74 FOR HEIGHT LOCATION GUIDANCE.
- ② LCL BRACE (24 REQD). SEE THE DETAIL ON PAGE 74 AND SPECIAL-NOTE 4 ON PAGE 73. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "R" ON PAGE 2.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE G" OR THE "CENTER GATE H" DETAIL ON PAGE 73 FOR CONTAINERS-CROSSWISE OR LENGTHWISE UNITS, RESPECTIVELY. SEE GENERAL NOTES "L" AND "M" ON PAGE 2.
- ④ STRUT, 4" X 4" BY CUT TO FIT (4 REQD FOR CROSSWISE, 4 REQD FOR MOST LENGTHWISE). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "K", "T", AND "U", ON PAGES 2 AND 3.
- ⑤ GATE HOLD DOWN, 2" X 3" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD) NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE THE "CENTER GATE G" DETAIL ON PAGE 73 FOR LOCATION GUIDANCE.



SECTION R-R

GATE RETAINER, 2" X 6" X 9" (4 REQD), NAIL TO A HORIZONTAL PIECE W/3-10d NAILS.

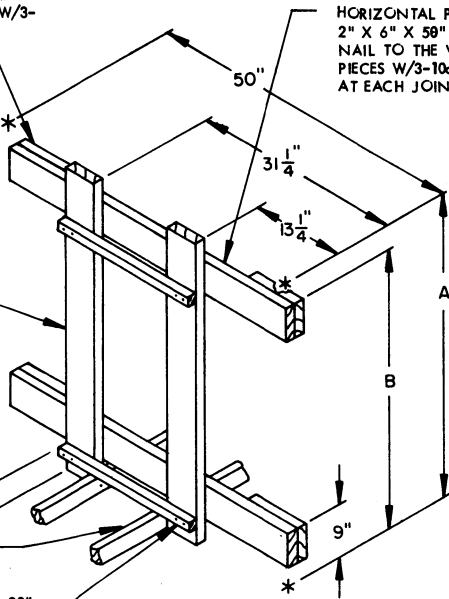
VERTICAL PIECE 2" X 6" BY A LENGTH TO SUIT (2 REQD).

HEIGHT OF STRUT LEDGER TO BE 4-1/2" LESS THAN HEIGHT OF ADJACENT HORIZONTAL PIECE.

PIECE MARKED ⑤

STRUT LEDGER, 2" X 2" X 30" (2 REQD), NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

HORIZONTAL PIECE, 2" X 6" X 50" (2 REQD), NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.



CENTER GATE G

THIS GATE IS FOR USE WITH CONTAINERS-CROSSWISE UNITS. REFER TO THE "CENTER GATE G" CHART BELOW FOR FIGURES REPRESENTED BY LETTERS ON THE ABOVE DETAIL.

UNIT	CENTER GATE G		CENTER GATE H	
	DIM A	DIM B	DIM A	DIM B
5-LAYER UNIT	44"	39-3/4"	44"	39-1/2"
6-LAYER UNIT	50"	46"	50"	45-3/4"
7-LAYER UNIT	51-1/2"	47-1/2"	56"	52"

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	313	157
2" X 2"	9	3
2" X 3"	8	4
2" X 6"	132	132
4" X 4"	6	8
NAILS	NO. REQD	POUNDS
6d (2")	144	1
8d (2-1/2")	288	3-1/4
10d (3)	56	1
16d (3-1/2")	16	1/2

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED, AND SHORTER BUT NOT LONGER CARS WILL BE USED.
2. THE BASIC HEIGHT UNIT (7 LAYER) IS SHOWN IN THE TYPICAL 1-WIDE LOAD. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A 1-WIDE CONTAINERS-CROSSWISE LOAD IS SHOWN AS TYPICAL. A CHART IS GIVEN TO SPECIFY THE HEIGHT OF THE VERTICAL PIECES AND THE POSITION OF THE HORIZONTAL PIECE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR 1-WIDE LENGTHWISE LOADS. THE CHART ALSO APPLIES TO THESE LOADS.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT, CENTERED ON THE UNIT LENGTH OR WIDTH, AS APPLICABLE.
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 PIECES, AS SHOWN ELSEWHERE ON THE APPLICABLE CENTER GATE FOR A SINGLE ROW, MAY BE USED IN LIEU OF PIECES MARKED ⑤.

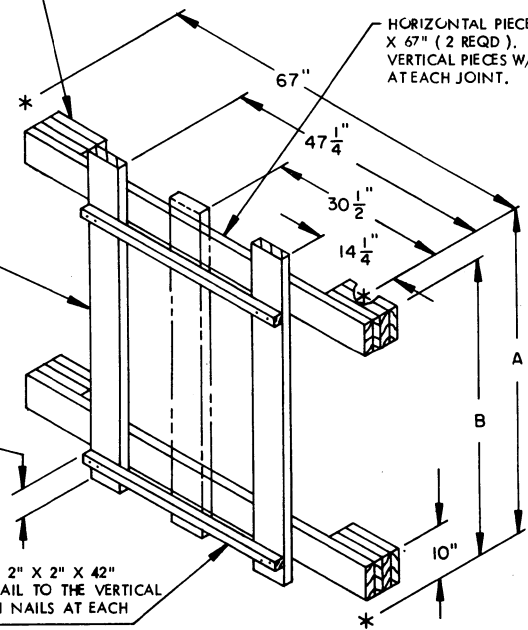
GATE RETAINER, 2" X 6" X 9" (TRIPLED) (4 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/3-10d NAILS. LAMINATE EACH ADDITIONAL PIECE IN A LIKE MANNER.

HORIZONTAL PIECES, 2" X 6" X 67" (2 REQD), NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

VERTICAL PIECE, 2" X 6" BY A LENGTH TO SUIT (2 REQD) (3 REQD FOR 9 PALLET UNITS LONG).

HEIGHT OF STRUT LEDGER TO BE 4-1/2" LESS THAN HEIGHT OF ADJACENT HORIZONTAL PIECE.

STRUT LEDGER, 2" X 2" X 42" (2 REQD), NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

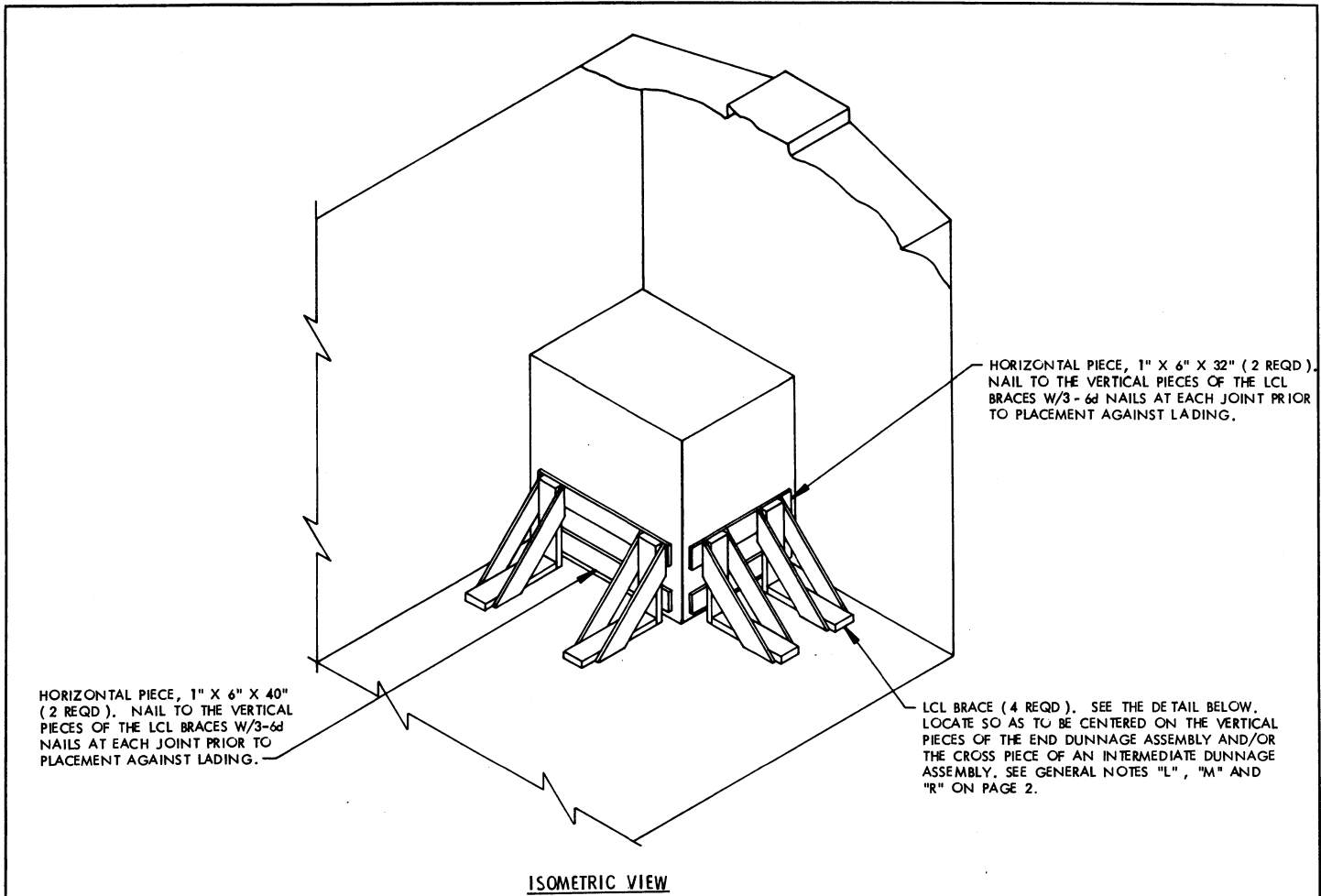


CENTER GATE H

THIS GATE IS FOR USE WITH CONTAINERS-LENGTHWISE UNITS. REFER TO THE CHART AT LEFT FOR FIGURES REPRESENTED BY LETTER ON THE DETAIL ABOVE.

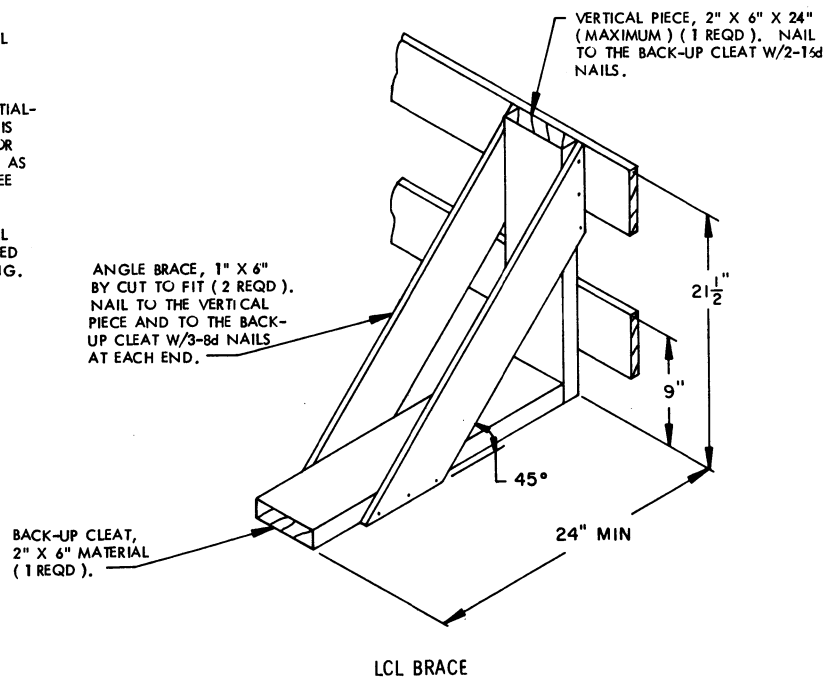
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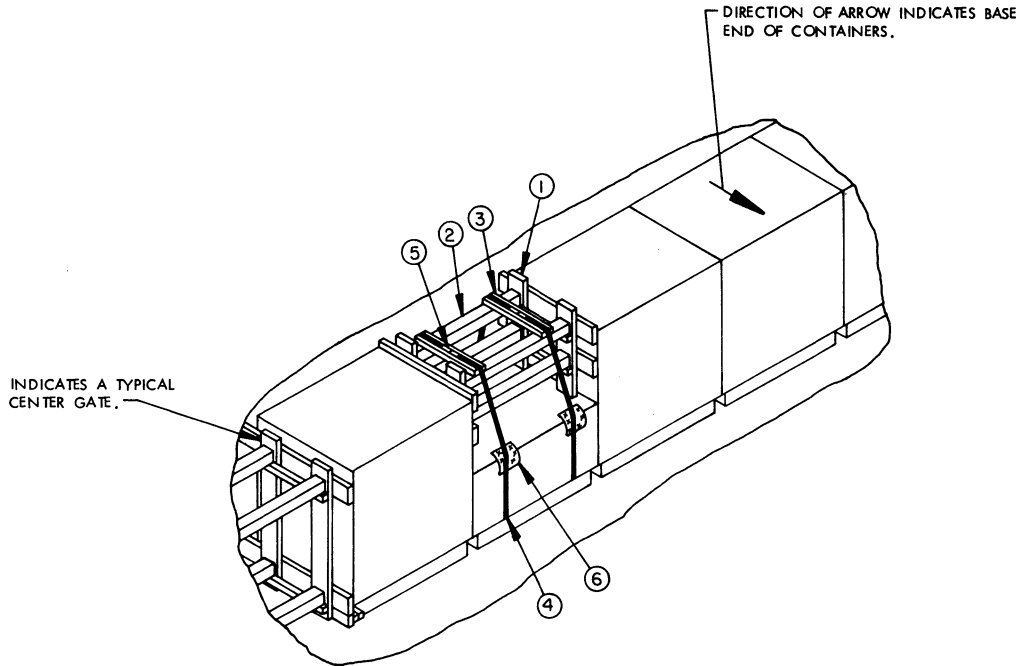
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	12	17,736 LBS
DUNNAGE		614 LBS
TOTAL WEIGHT		18,410 LBS



SPECIAL NOTES:

1. AN 8'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "R" ON PAGE 2.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE TYPICAL LOAD. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A CONTAINERS-CROSSWISE UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR CONTAINERS-LENGTH WISE UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 4.
4. 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.





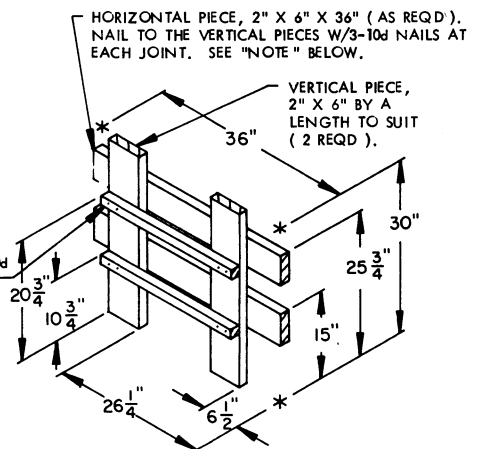
**POSITIONING OF PARTIAL UNIT OF CROSSWISE-
POSITIONED CONTAINERS WITHIN A LAYER**

KEY NUMBERS

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 CONTAINERS-CROSSWISE LOAD.
2. THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE SHIPMENT OF A PARTIAL UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. 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 OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 3-LAYER UNIT WITHIN A 7-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SEVEN (7) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/21-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
5. THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
6. THE "POSITIONING OF PARTIAL UNIT OF CROSSWISE-POSITIONED CONTAINERS WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
7. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 78 MAY BE MORE ECONOMICAL.
8. THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

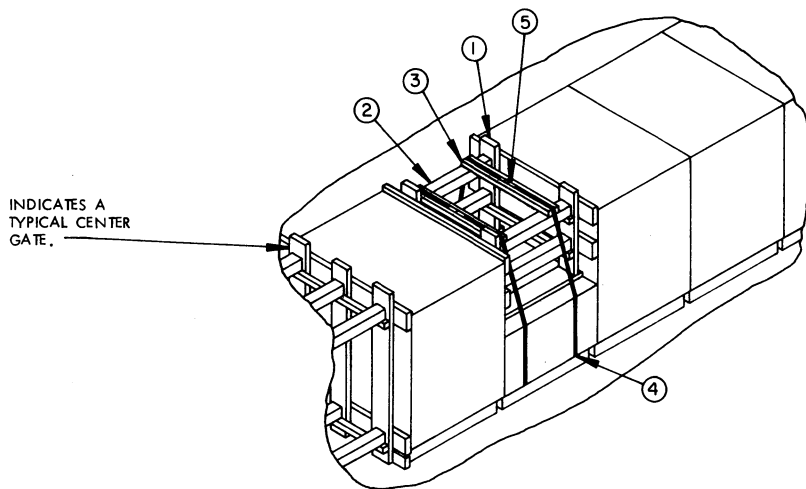
- ① PARTIAL UNIT GATE (2 REQD). SEE THE "PARTIAL UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② STRUT, 4" X 4" X 42-1/2" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ STRAPPING BOARD, 2" X 4" X 23-1/4" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- ④ UNITIZING STRAP, 1-1/4" X .031" X .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD; 2 PER JOINT). SEE GENERAL NOTE "N" ON PAGE 2.
- ⑥ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.



NOTE:

THE QUANTITY AND LOCATION OF THE HORIZONTAL PIECES MUST BE ADJUSTED SO AS TO CENTER ON THE PALLET DUNNAGE ASSEMBLIES OF THE ADJACENT PALLET UNITS, BASED ON THE SIZE OF THE PARTIAL UNIT AND THE HEIGHT OF THE UNITS IN THE LOAD.

PARTIAL UNIT GATE A



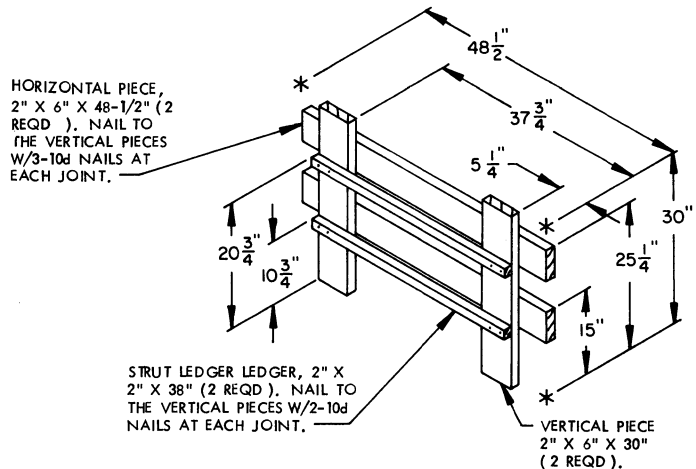
POSITIONING OF PARTIAL UNIT OF LENGTHWISE-POSITIONED CONTAINERS WITHIN A LAYER

SPECIAL NOTES:

- 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 CONTAINERS LENGTHWISE LOAD.
- THE BASIC HEIGHT UNIT (7-LAYER) IS SHOWN IN THE SHIPMENT OF A PARTIAL UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
- A LESS-THAN-FULL HEIGHT PALLET UNIT OF CONTAINERS-LENGTHWISE 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 7-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
- A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SEVEN (7) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/21-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINERS.
- THE FILLERS AS REFERENCED IN SPECIAL NOTE 4 AND THE DUNNAGE DEPICTED ABOVE FOR THE SHIPMENT OF THE PARTIAL UNIT MAY BE REMOVED WHEN A SHIPMENT REACHES DESTINATION. OR IF DESIRED, THE FILLERS MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
- THE "POSITIONING OF PARTIAL UNIT OF LENGTHWISE-POSITIONED CONTAINERS WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- THE PARTIAL UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE UNIT AND A CENTER GATE.

KEY NUMBERS

- PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTES "L" AND "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- STRUT, 4" X 4" X 30" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- STRAPPING BOARD, 2" X 4" X 35" (2 REQD). NAIL TO THE STRUT PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- UNITIZING STRAP, 1-1/4" X .031" X .035" BY LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "N" ON PAGE 2.

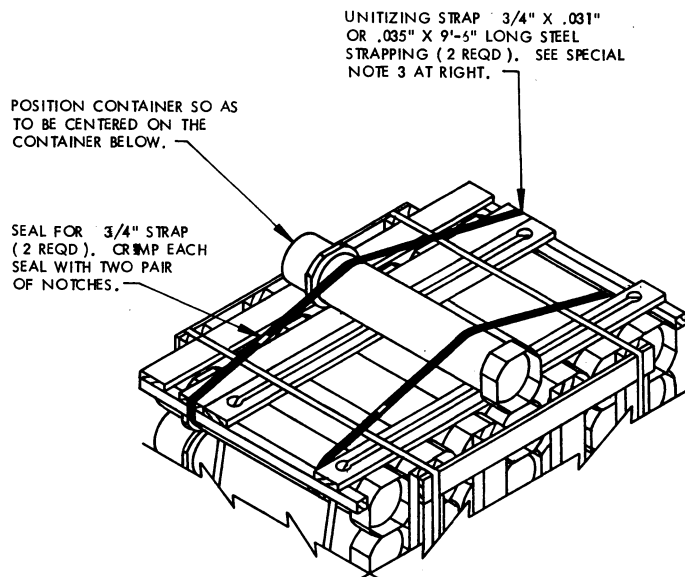


PARTIAL UNIT GATE B

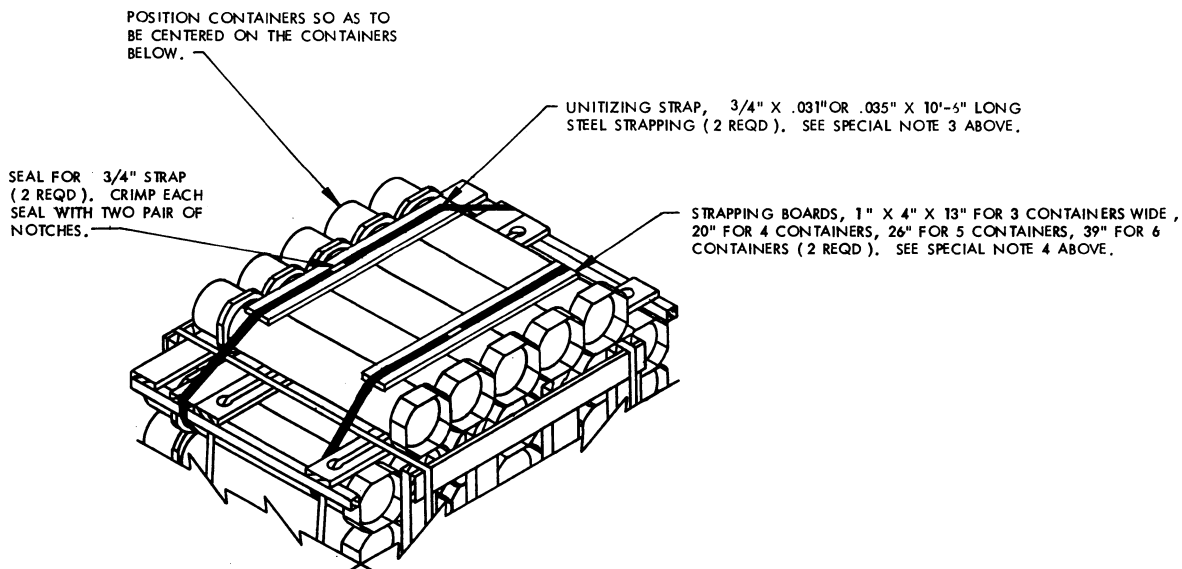
THE LOCATION OF THE HORIZONTAL PIECES MUST BE ADJUSTED FOR THE APPLICABLE UNIT TO CENTER ON THE PALLET DUNNAGE ASSEMBLIES.

SPECIAL NOTES:

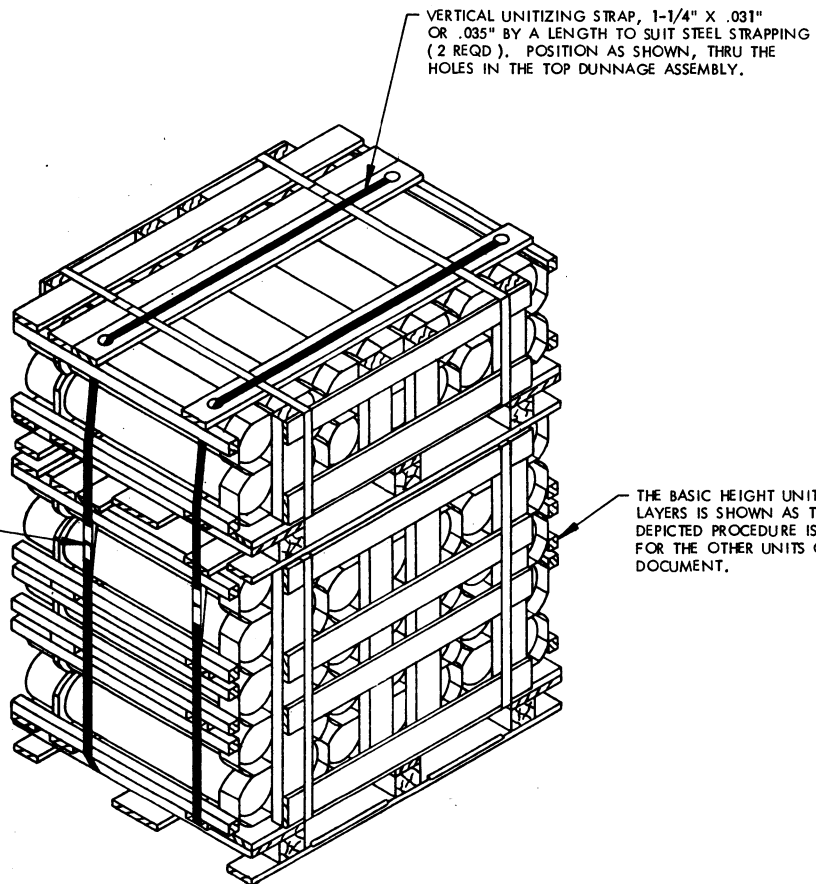
1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFT-OVER CONTAINERS ARE DESCRIBED AS 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 78 OR WITHIN A LAYER AS SHOWN ON PAGES 75 AND 76.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE UNITIZING STRAP SHOULD NOT GO AROUND THE INTERMEDIATE DUNNAGE ASSEMBLY; THE STRAP SHOULD BE THREADED BEHIND THE 2" X 2" PIECES OF THE ASSEMBLY. ALSO NOTE THAT THE STRAP OVER THE BASE END OF THE CONTAINER(S) MUST BE POSITIONED OVER THE TOP DUNNAGE ASSEMBLY WHILE THE STRAP OVER THE OPENING END WILL BE THREADED BEHIND THE 2" X 2" OF THE TOP DUNNAGE ASSEMBLY.
4. WHEN THREE (3) OR MORE CONTAINERS ARE STRAPPED TO THE TOP, STRAPPING BOARDS ARE REQUIRED.
5. 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.
6. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFT-OVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.



SECUREMENT OF ONE CONTAINER



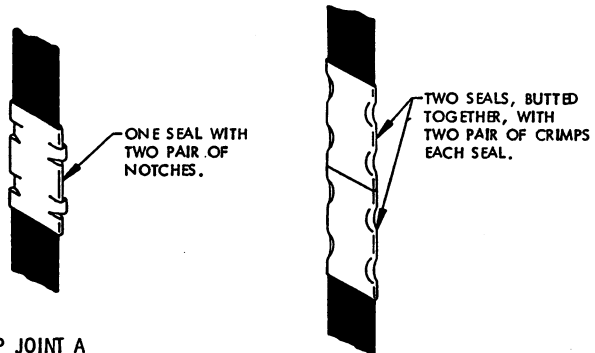
SECUREMENT OF FIVE CONTAINERS



SECUREMENT OF PARTIAL UNIT ON TOP

THIS PROCEDURE IS APPLICABLE ONLY FOR USE IN A CROSSWISE LOAD. CAUTION: THE PARTIAL UNIT ON TOP IS LIMITED TO NOT MORE THAN TWO (2) LAYERS OF CONTAINERS. FOR SHIPMENT OR MORE THAN TWO LAYERS OF CONTAINERS, OR AN ALTERNATIVE METHOD FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGE 75.

PROCEDURES FOR SHIPMENT OF PARTIAL UNITS



STRAP JOINT A

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

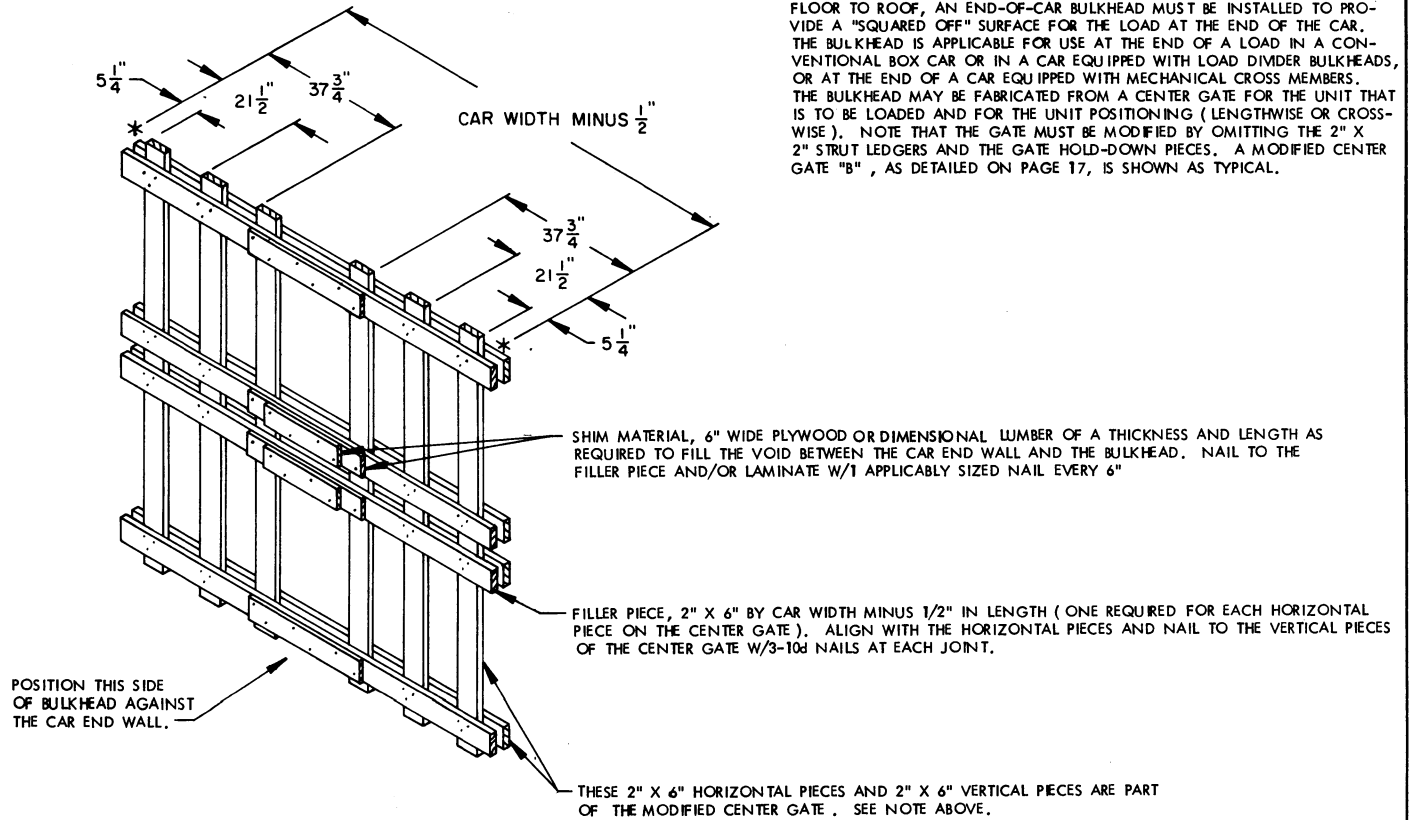
STRAP JOINT B

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

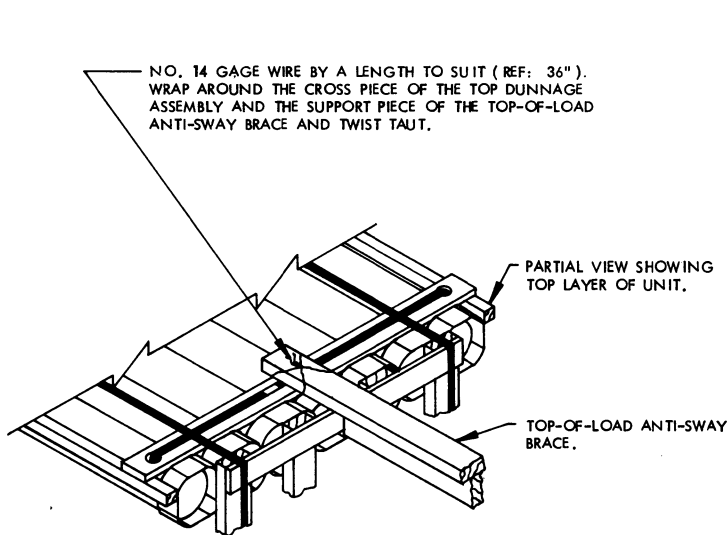
DETAILS

NOTE:

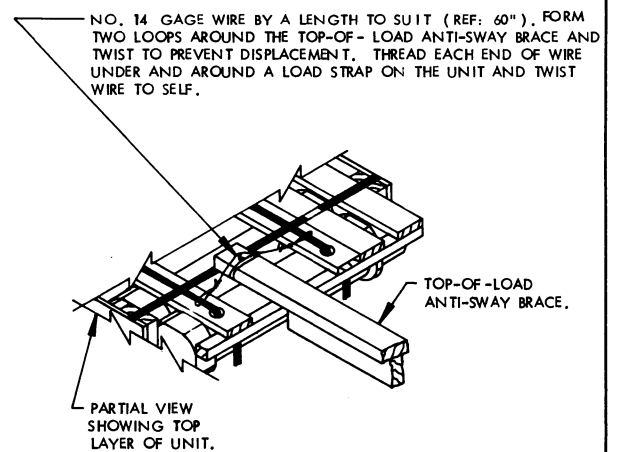
IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END 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 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 MODIFIED CENTER GATE "B", AS DETAILED ON PAGE 17, IS SHOWN AS TYPICAL.



END-OF-CAR BULKHEAD



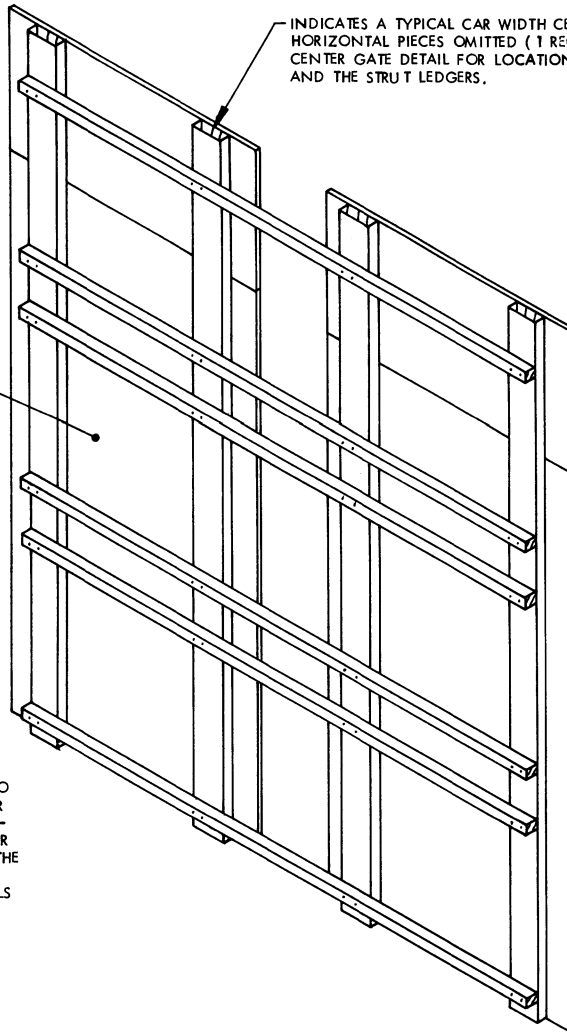
TIE WIRE APPLICATION A



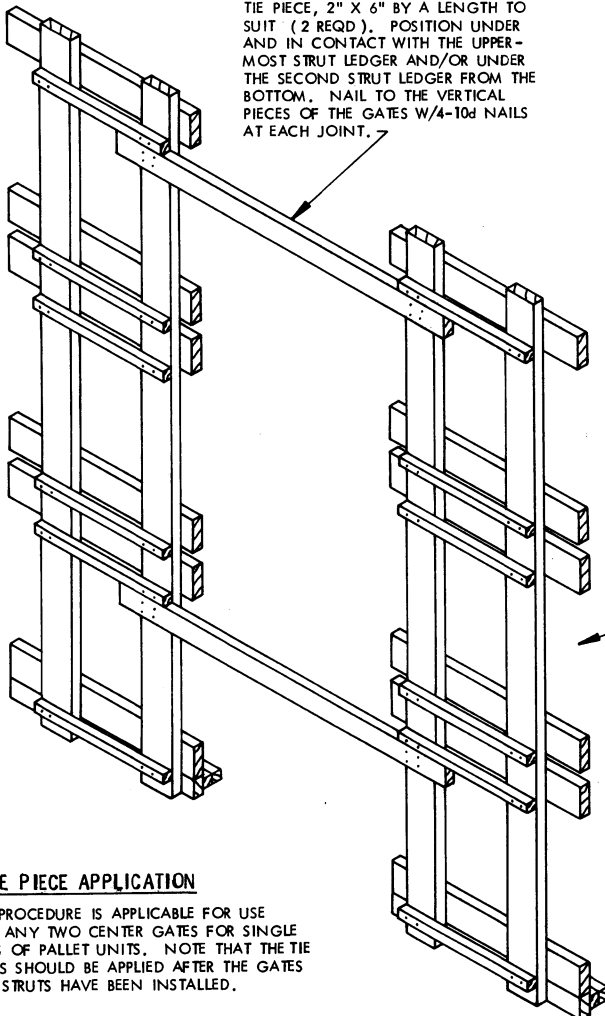
TIE WIRE APPLICATION B

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

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



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



PLYWOOD CENTER GATE ALTERNATIVE

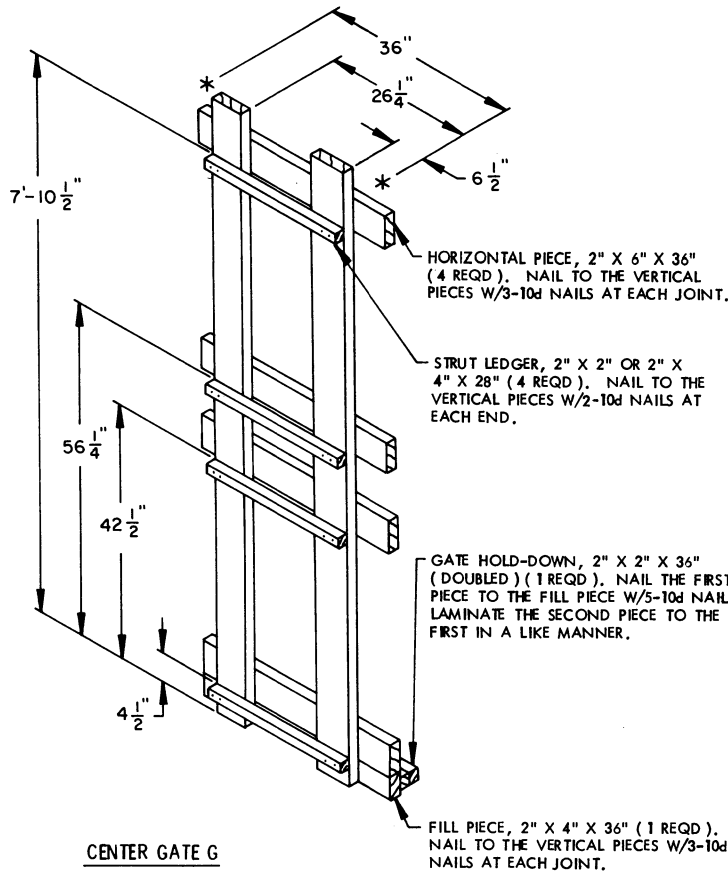
CENTER GATE "F" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE DEPICTED HEREIN, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW. THE GATE HOLD-DOWN PIECES MUST BE SECURED TO THE PLYWOOD.

INDICATES A TYPICAL CENTER GATE FOR A SINGLE ROW (2 REQD). SEE THE APPLICABLE CENTER GATE DETAIL, FOR THE UNIT BEING SHIPPED, ON PAGE 81 OR 82. A GATE FOR UNITS WHICH ARE POSITIONED WITH THE UNIT WIDTH PARALLEL TO THE CAR SIDEWALL IS SHOWN. THE PROCEDURE IS ALSO APPLICABLE TO GATES FOR UNITS WHICH ARE POSITIONED WITH THE UNIT LENGTH PARALLEL TO THE CAR SIDEWALL.

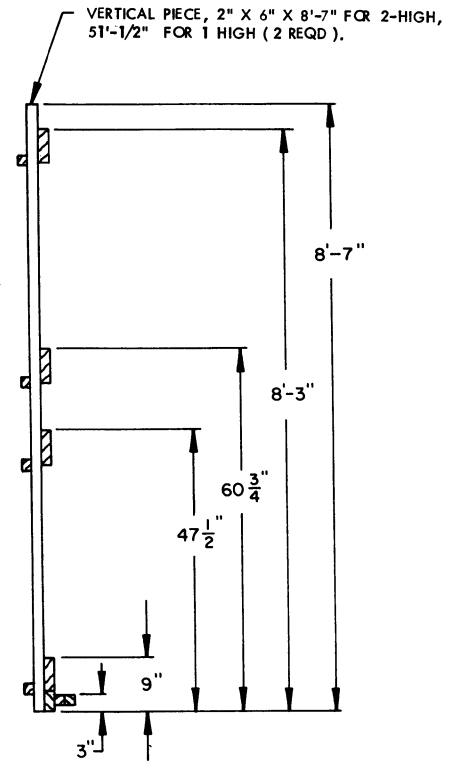
TIE PIECE APPLICATION

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

DETAILS



CENTER GATE G

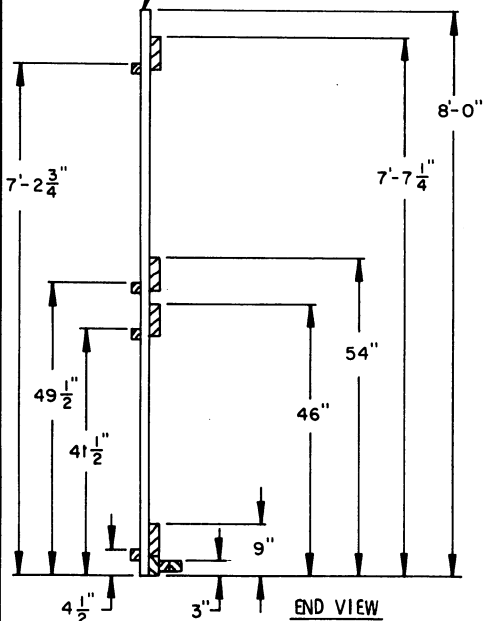


END VIEW

FOR A SINGLE ROW OF CROSSWISE POSITIONED CONTAINERS, BASIC HEIGHT UNIT (7-LAYER). SEE SPECIAL NOTE 8 ON PAGE 7 AND SPECIAL NOTE 10 ON PAGE 9.

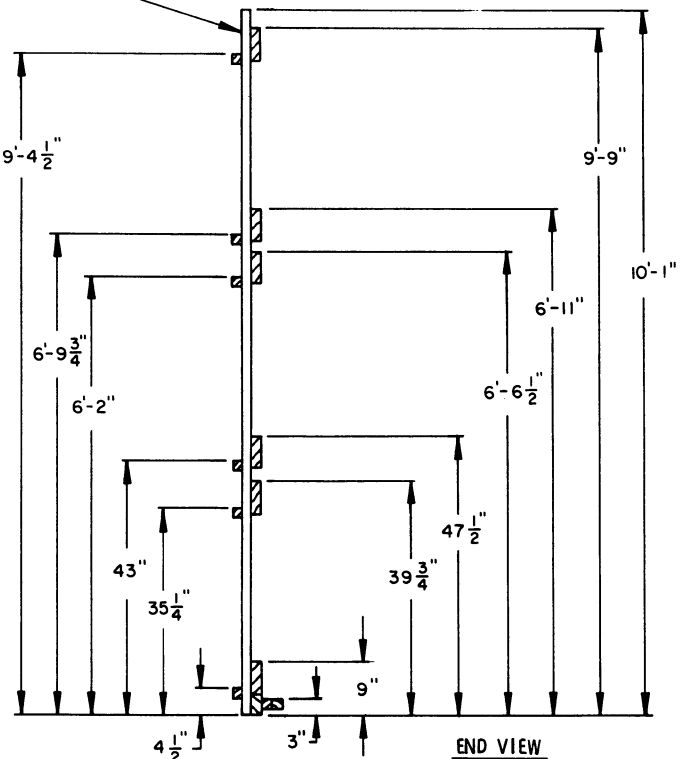
VERTICAL PIECE, 2" X 6" X 10'-1" FOR A 3-HIGH LOAD, (7-LAYER UNIT) 6'-11" FOR A 2-HIGH LOAD, 44" FOR A 1-HIGH LOAD (2 REQD).

VERTICAL PIECE, 2" X 6" X 8'-0" FOR A 2-HIGH LOAD, 50" FOR A 1-HIGH LOAD (2 REQD).



END VIEW

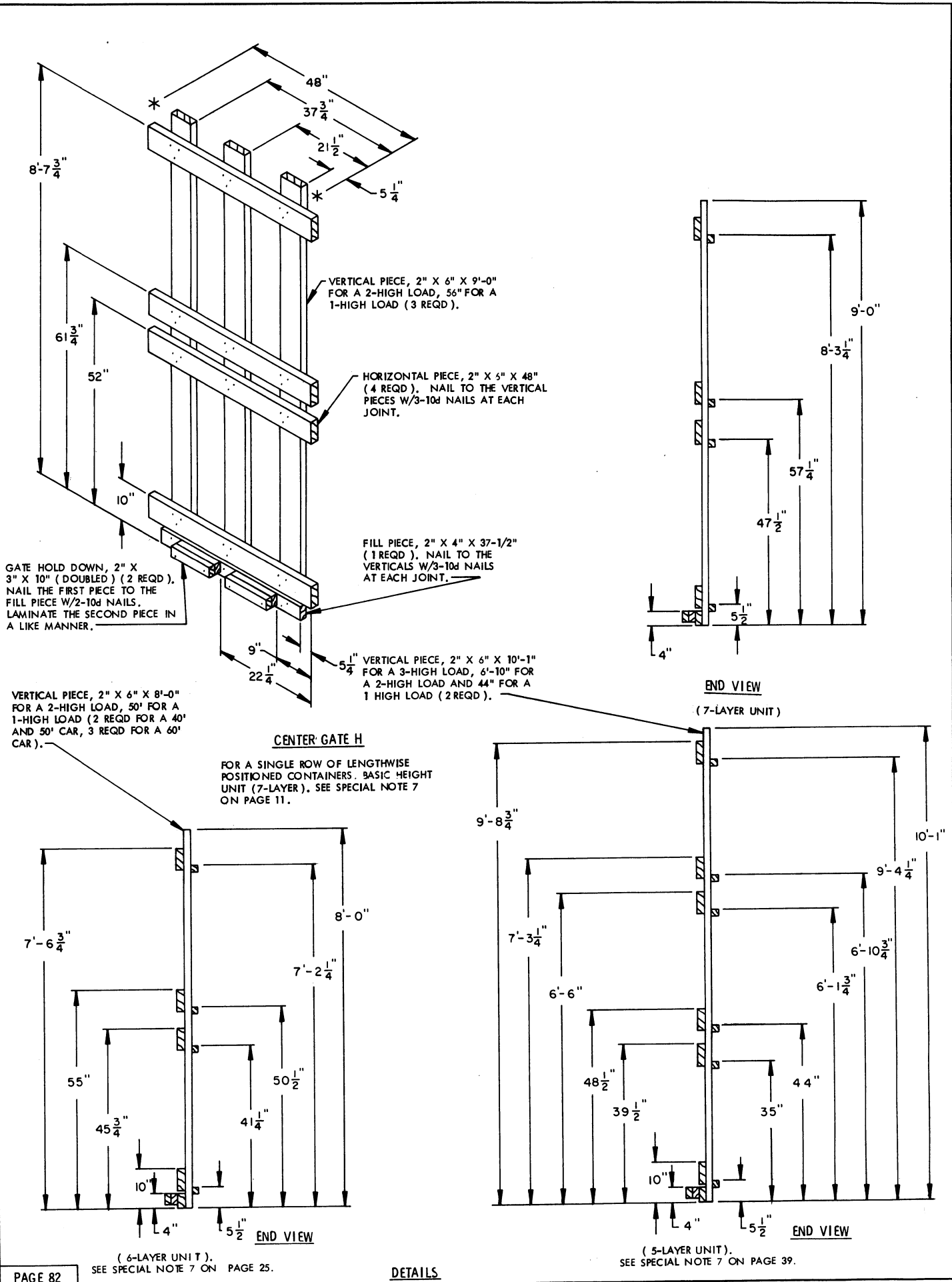
(6-LAYER UNIT). SEE SPECIAL NOTE 8 ON PAGE 21 AND SPECIAL NOTE 10 ON PAGE 23.

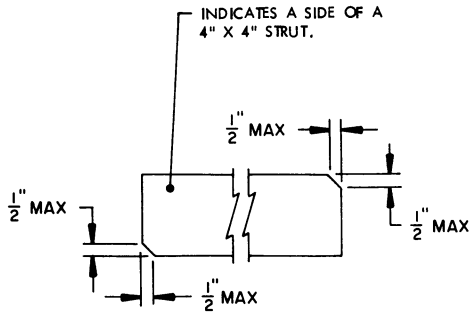


END VIEW

(5-LAYER UNIT). SEE SPECIAL NOTE 9 ON PAGE 35.

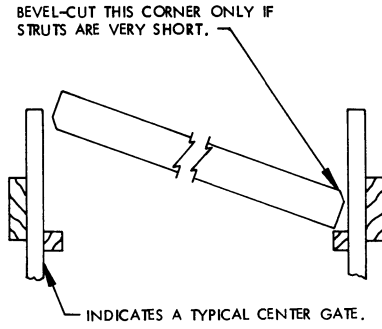
DETAILS





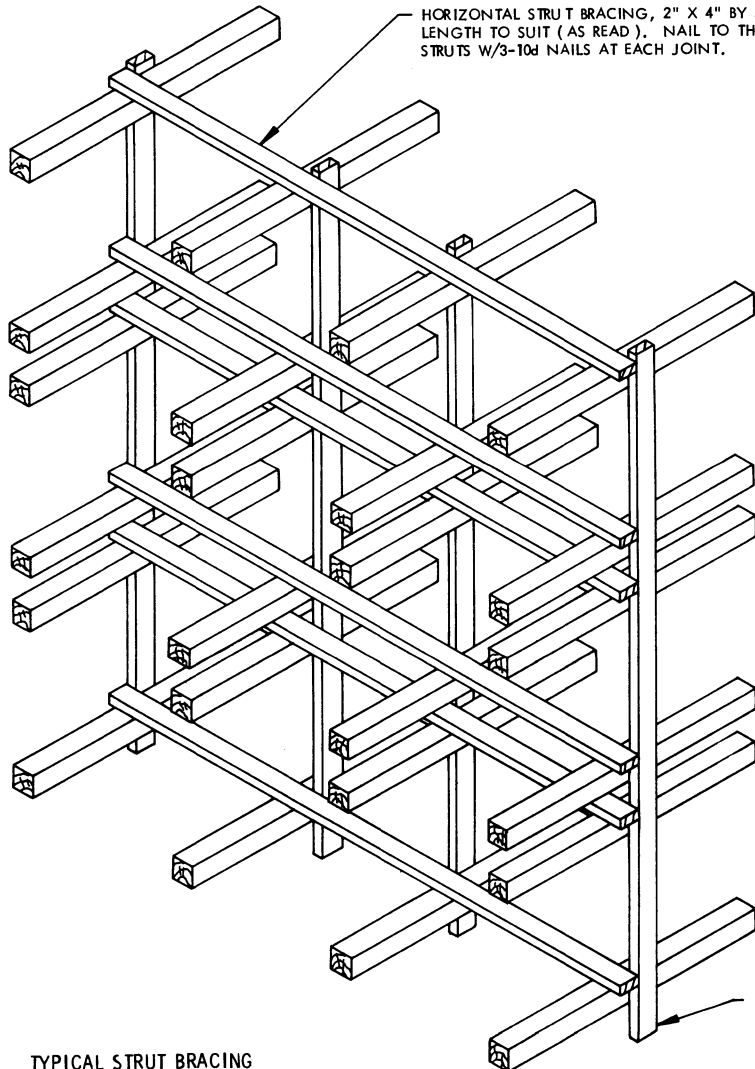
BEVEL CUT

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



STRUT INSTALLATION

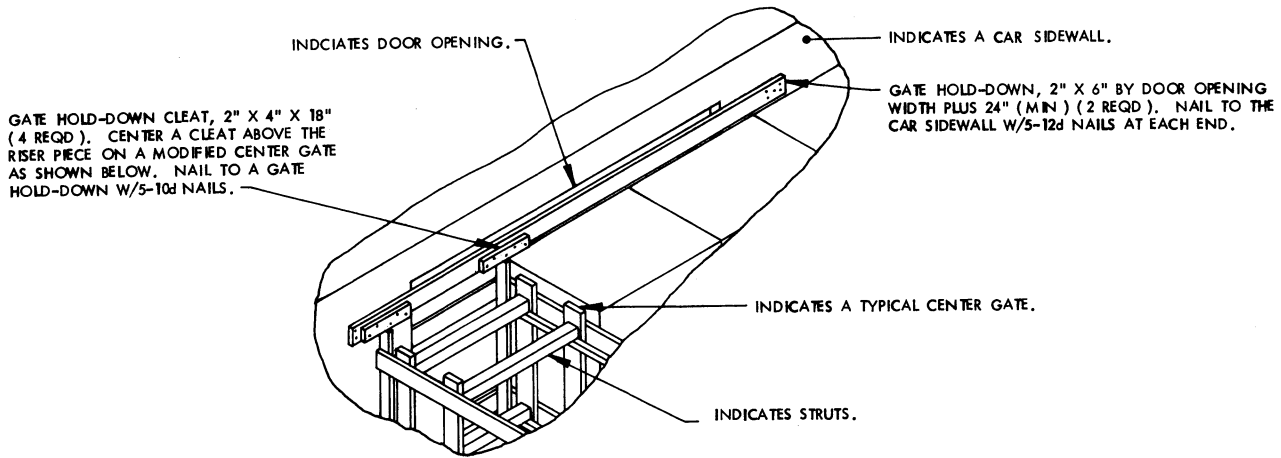
SEE GENERAL NOTE "U" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.



TYPICAL STRUT BRACING

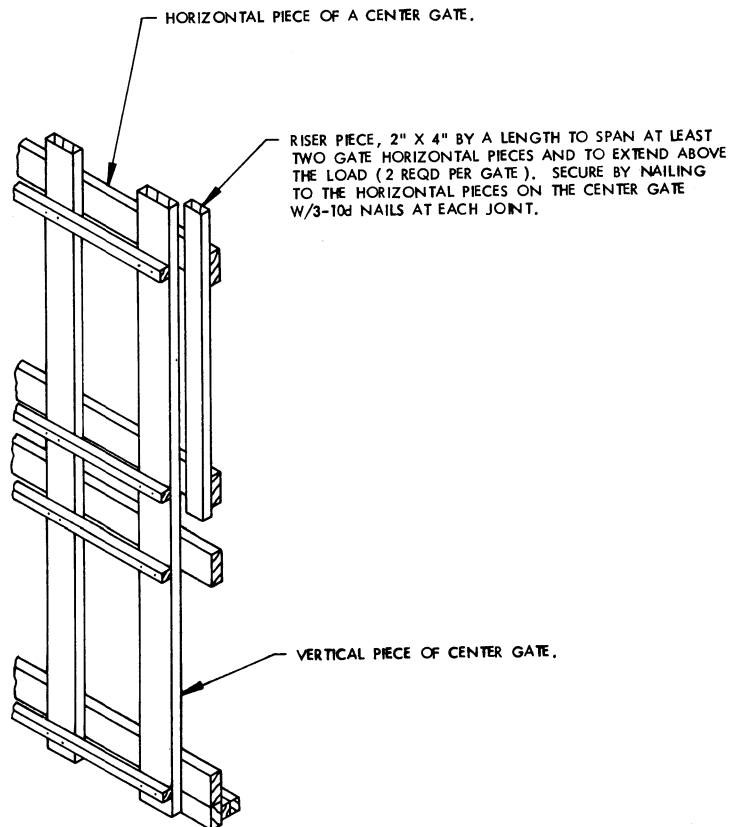
SEE GENERAL NOTE "T" ON PAGE 2.

VERTICAL PIECE, 2" X 4" BY A LENGTH TO EXTEND A MINIMUM OF 2" ABOVE THE TOP STRUT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.



ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD-DOWN WHICH CAN BE USED IF DESRED, 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.



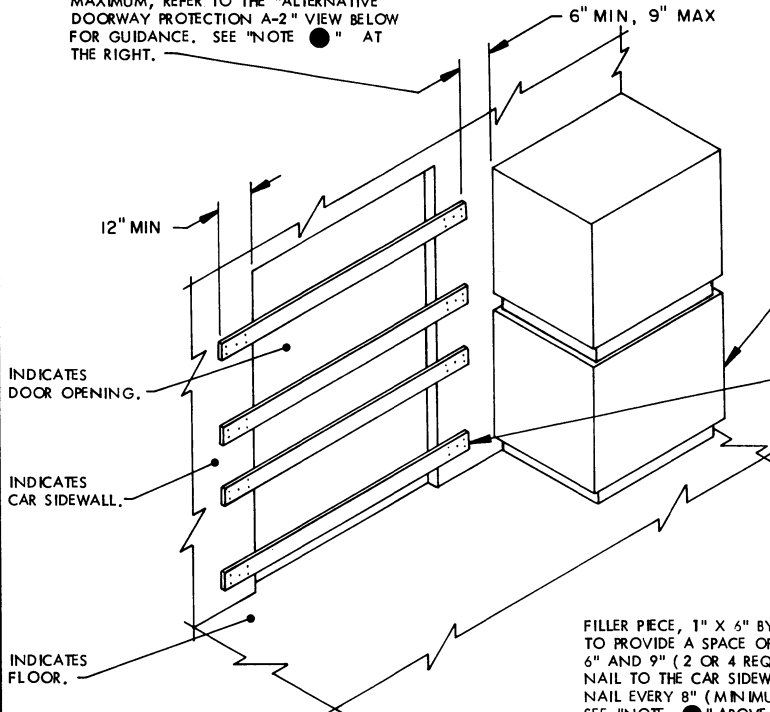
CENTER GATE MODIFICATION

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

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

NOTE ●:

THE TOLERANCE DIMENSION (6" MIN, 9" MAX) IS ALLOWED TO PROVIDE FOR CLEARANCE DURING THE NORMAL LONGITUDINAL SHIFTING OF A LOAD IN TRANSIT, 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. IF AN EXCESS LATERAL SPACE IS FILLED BY NAILING LUMBER TO THE CAR SIDEWALL, AS IS PERMITTED FOR THE LOADS ON PAGES 8, 22 AND 34, 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.



INDICATES A TYPICAL PALLET UNIT.

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

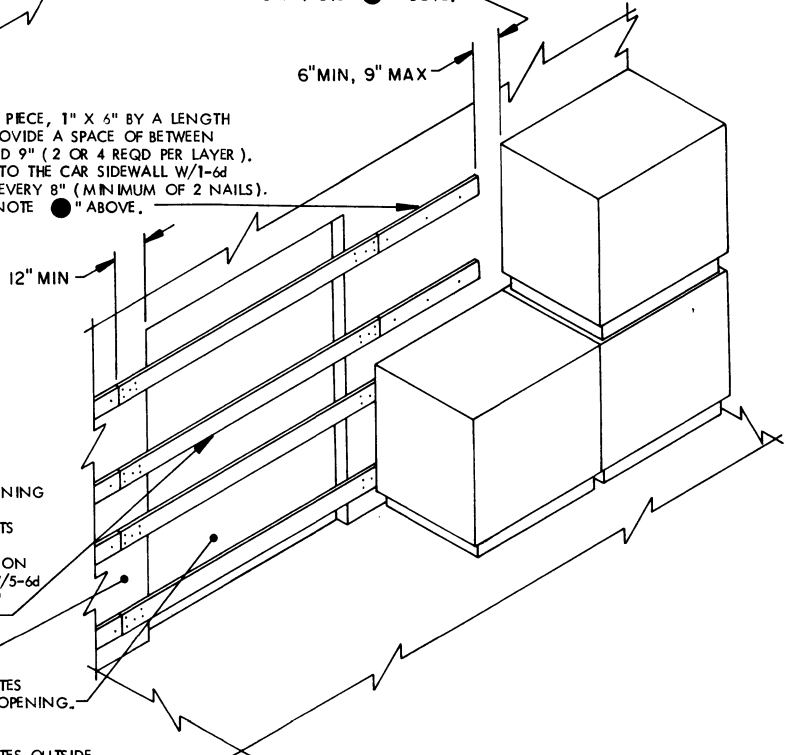
SEE "NOTE ●" ABOVE.

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

ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE "ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 86 OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED WITHIN THE LOADS SHOWN ON PAGES 14, 28 AND 42.

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



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

INDICATES CAR SIDEWALL.

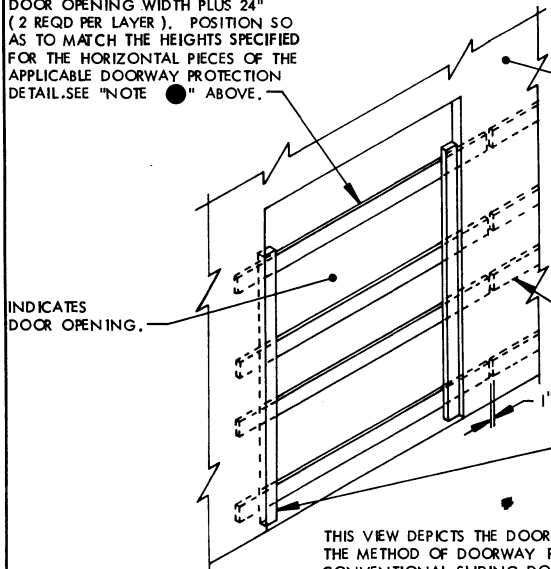
INDICATES DOOR OPENING.
INDICATES OUTSIDE WALL OF CAR.

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.

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

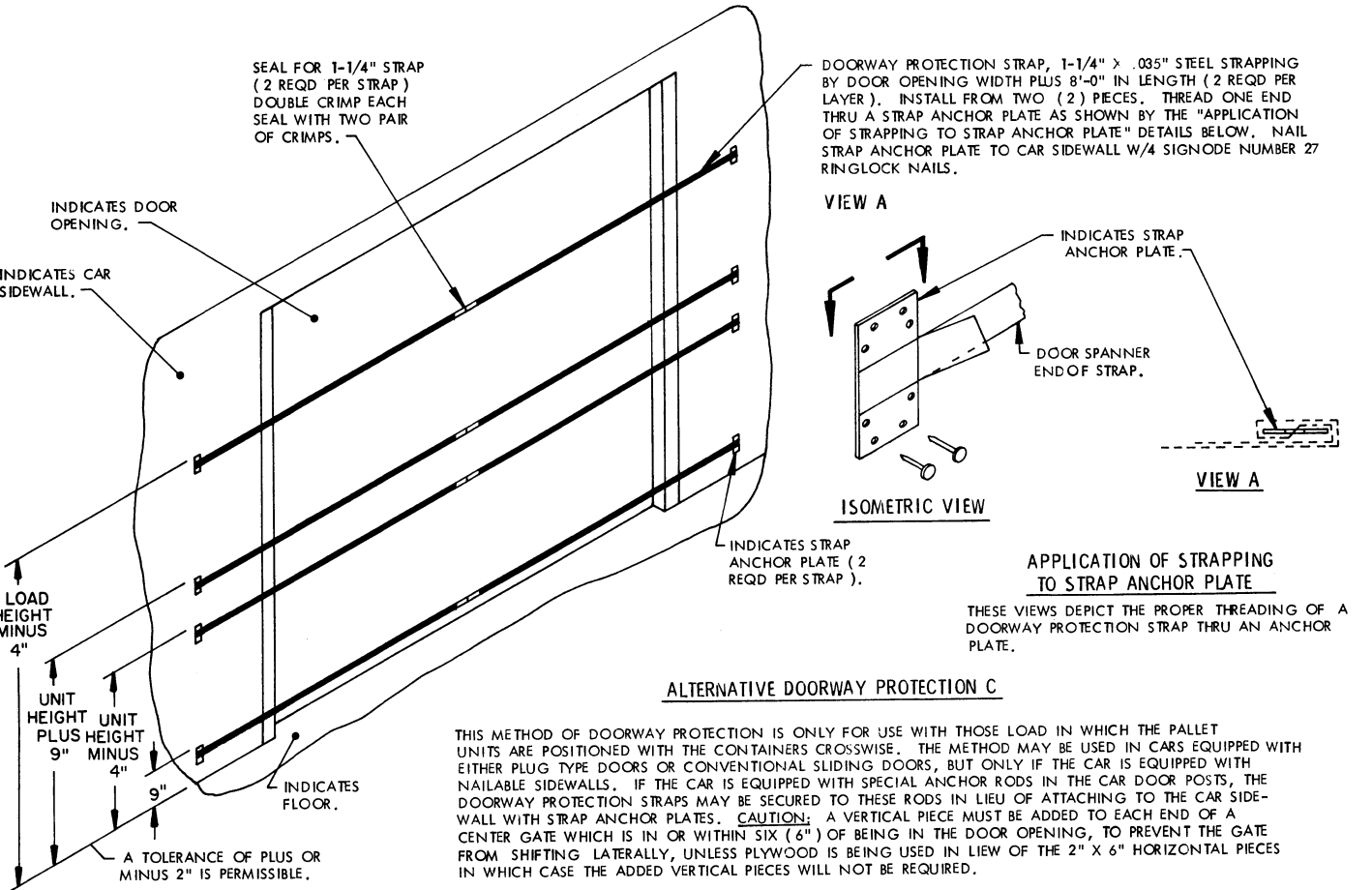
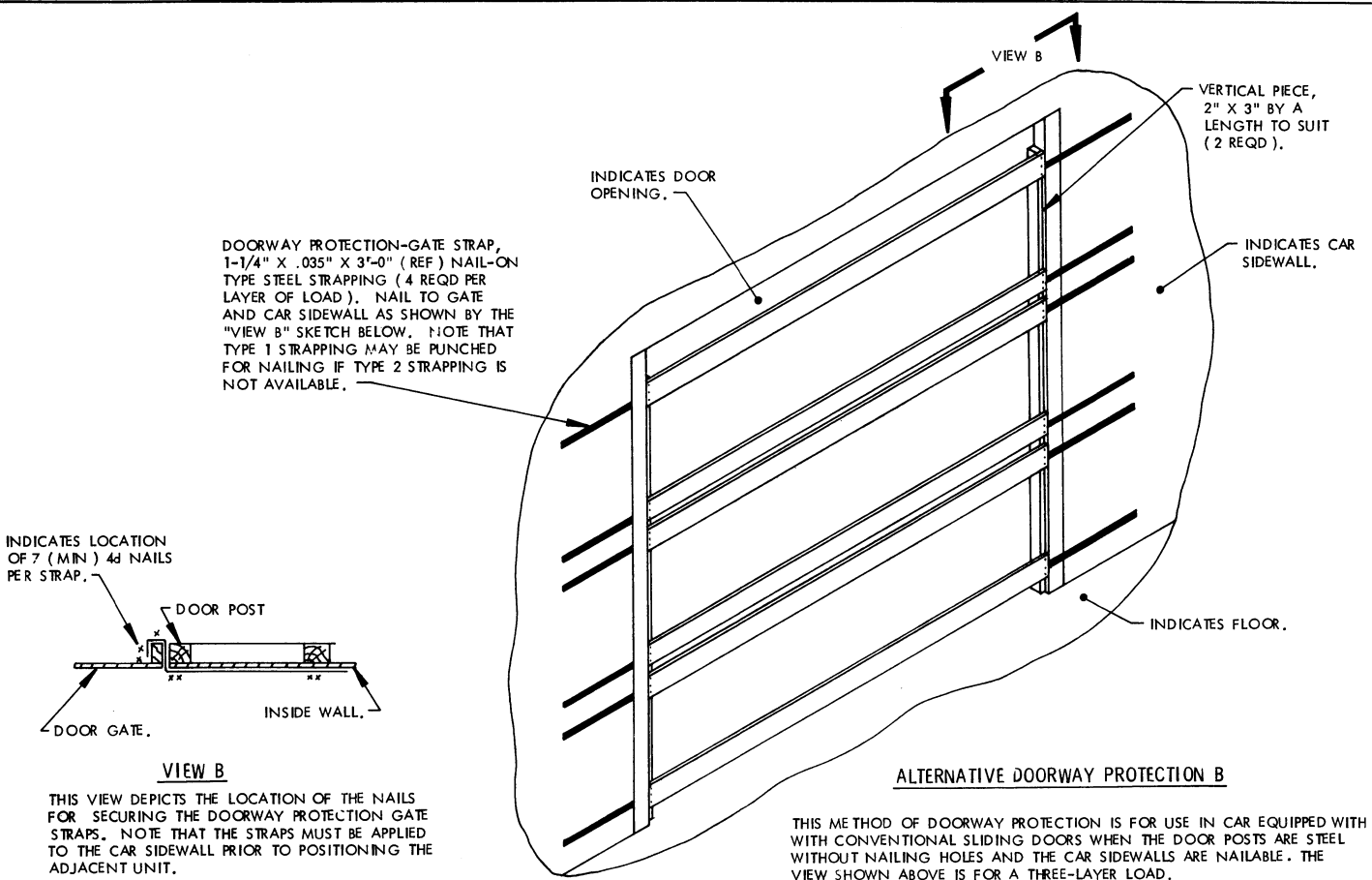
SUPPORT PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION AGAINST DOOR POST AND NAIL TO THE DOOR SPANNER PIECES W/3-10d NAILS AT EACH JOINT.

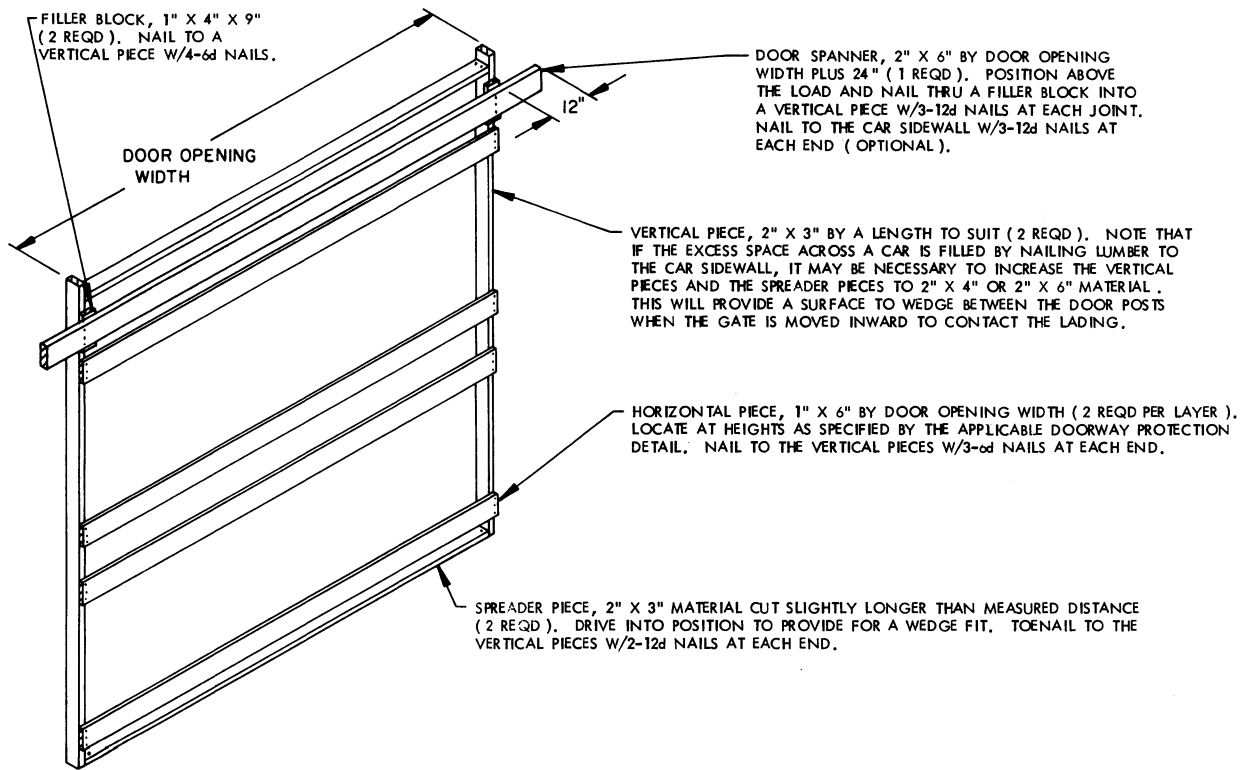


INDICATES DOOR OPENING.

ALTERNATIVE DOORWAY PROTECTION A-3

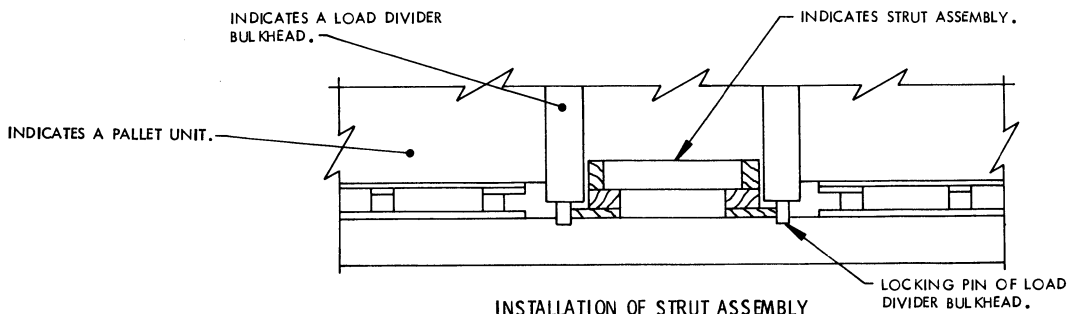
THIS VIEW DEPICTS THE DOOR OPENING OF A CAR AS IT APPEARS WHEN LOOKING AT IT FROM OUTSIDE THE CAR. THE METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE FOR THE LOADING SIDE OF THE CAR. NOTE THAT THE ADJACENT PALLET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





ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT AVAILABLE. IF THE CAR HAS AVAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 85 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 84.

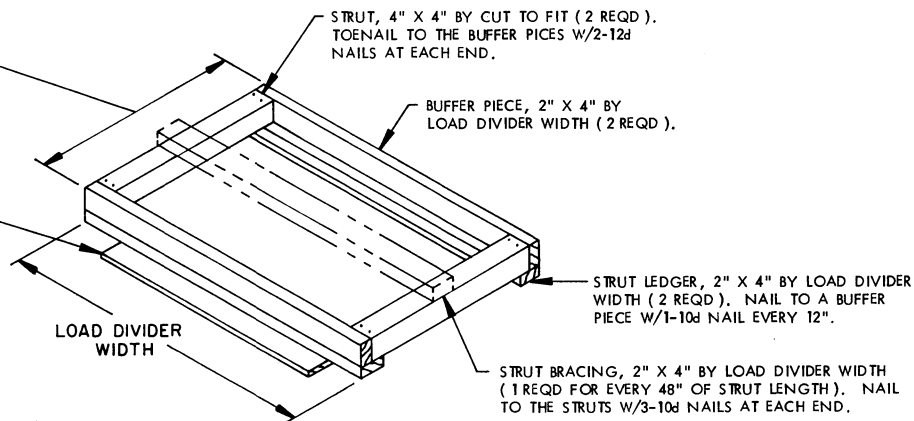


INSTALLATION OF STRUT ASSEMBLY

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 BULKHEAD.

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

HOLD DOWN, 1" X 8" BY CUT TO FIT BETWEEN LOCKING PINS AT EACH SIDE OF THE LOAD DIVIDER (2 REQD). NAIL TO THE STRUT LEDGER W/1-6d NAIL EVERY 12".

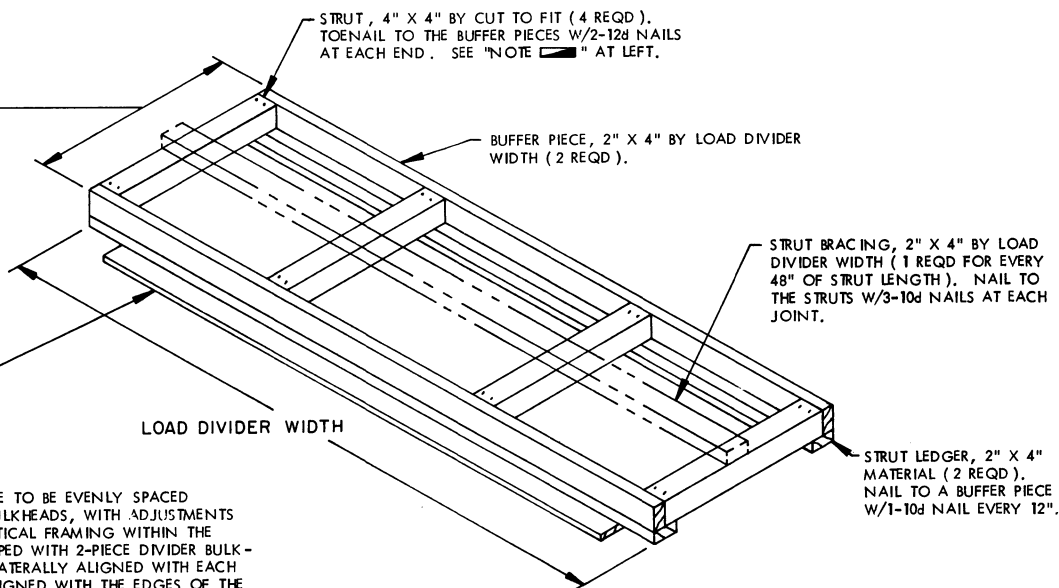


STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

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

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

HOLD DOWN, 1" X 8" BY CUT TO FIT BETWEEN LOCKING PINS AT EACH SIDE OF THE LOAD DIVIDER (2 REQD). NAIL TO THE STRUT LEDGER W/1-6d NAIL EVERY 12".

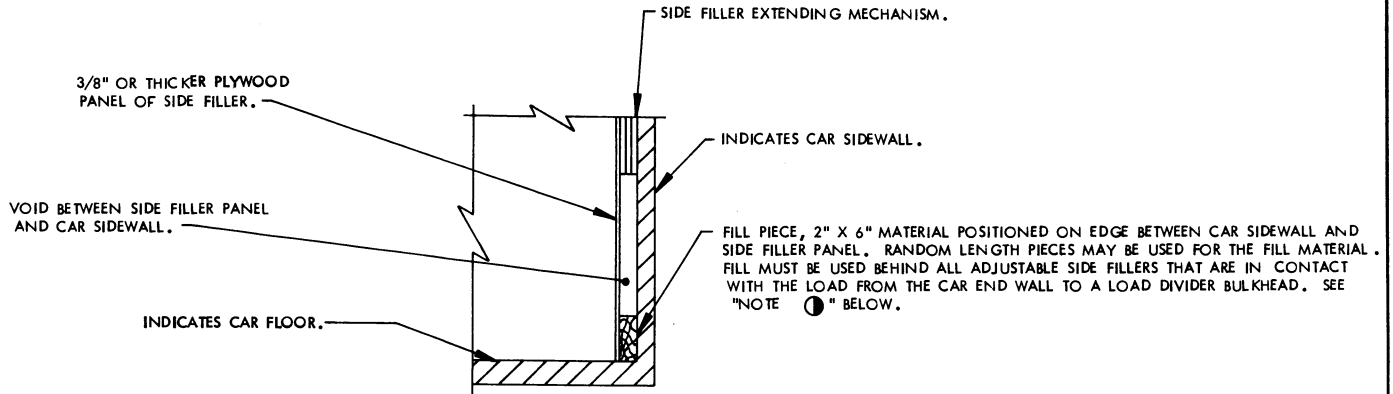


STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

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.

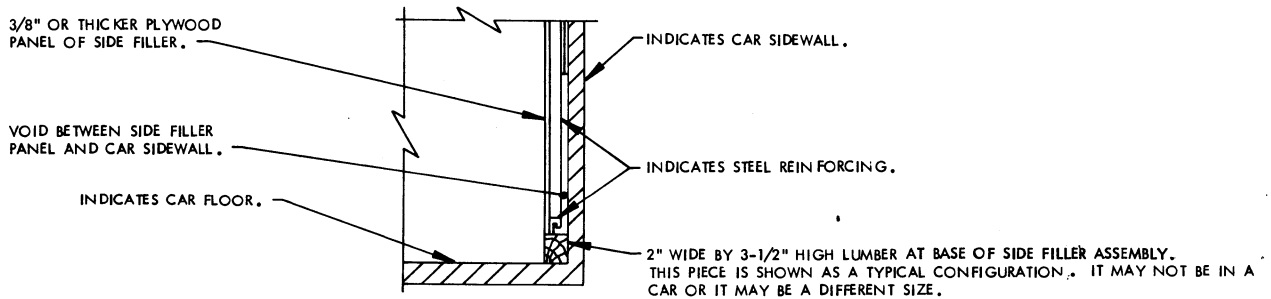


TYPICAL TYPE A

THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR 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 FILLERS 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.

