

GENERAL NOTES

(GENERAL NOTES CONTINUED)

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE PA91 SERIES PROPELLING CHARGE CONTAINER WHEN UNITIZED ON A 35" X 45-1/2" PALLET. SEE THE PICTORIAL VIEWS ON PAGE 4. REFER TO U.S. ARMY DARCOM DRAWING 19-48-4042A/13-20PM1001 FOR UNITIZATION PROCEDURES FOR THE PA91 SERIES CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. CAUTION: METAL PROPELLING CHARGE CONTAINERS THAT OVERHANG THE PALLET END MUST NOT BE ALLOWED TO CONTACT STEEL SIDEWALLS OR END WALLS OF BOX CARS. THIS TYPE OF UNIT LOAD SHOULD BE SHIPPED IN BOX CARS HAVING WOOD SIDEWALLS AND/OR END WALLS. IF CARS WITH WOOD SIDEWALLS AND/OR END WALLS ARE NOT AVAILABLE, AND ALL-STEEL CARS ARE USED, THE SIDEWALLS AND/OR END WALLS MUST BE LINED WITH DIMENSIONAL LUMBER, PLYWOOD, HARDBOARD, OR SOLID FIBERBOARD. THE LINING SHOULD BE PROVIDED WHEREVER METAL-OF-CONTAINER TO METAL-OF-CAR CONTACT IS POSSIBLE. REFER TO PAGE 75 FOR GUIDANCE.
- E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF CONTAINERS AGAINST THE CAR END WALL OR SIDEWALL AS APPLICABLE TO THE LOAD BEING SHIPPED. LONGITUDINALLY ADJACENT LENGTHWISE UNITS WILL BE POSITIONED WITH BASE END AGAINST BASE END OR BELL END AGAINST BELL END OF CONTAINERS.
- F. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT, IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHARTS ON PAGE 48 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- G. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLETIZED UNITS OF PROPELLING CHARGES IS THE RESPONSIBILITY OF THE ORIGINATING CARRIER AND THE SHIPPER. ONLY CARS WHICH HAVE "SOUND" FLOORS AND ARE IN OTHERWISE PROPER CONDITION, IN ACCORDANCE WITH THE REQUIREMENTS OF THE APPLICABLE REGULATORY DOCUMENTS, WILL BE SELECTED.
- H. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 76 FOR GUIDANCE.
- J. BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS HAVE BEEN SHOWN, HOWEVER, THE DEPICTED OUTLOADING PROCEDURES ARE ALSO APPLICABLE FOR CARS EQUIPPED WITH PLUG DOORS. CAUTION: DUNNAGE MATERIAL MUST NOT BE NAILED TO ANY PLUG DOOR, WHETHER AUXILIARY OR MAIN. ALSO, AFTER THE PLUG DOORS ON A CAR ARE CLOSED AND READY FOR THE INSTALLATION OF CAR SEALS, A PIECE OF WIRE OF SUITABLE SIZE WILL BE USED IN ADDITION TO, AND IN CONJUNCTION WITH EACH CAR SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- K. THE USE OF AN OFFSET LOADING PATTERN WILL FACILITATE LOADING AND UNLOADING OPERATIONS IN THE DOORWAY AREA OF THE CAR. WHEN POSSIBLE TO DO SO, A FULL LOAD SHOULD BE BUILT USING AN OFFSET LOADING PATTERN. FOR INSTANCE, A LOAD CONSISTING OF AN EVEN NUMBER OF LOAD UNITS AND HAVING TWO MORE LOAD UNITS IN ONE END OF THE CAR THAN IN THE OPPOSITE END, OR A LOAD CONSISTING OF AN ODD NUMBER OF LOAD UNITS AND HAVING ONE MORE LOAD UNIT IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- L. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH 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.

(CONTINUED AT RIGHT)

- M. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- N. 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.
- O. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CARLOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2-1/2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE A COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. NOTE: STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD RESTRAINING FLOOR DUNNAGE APPLICATION.
- P. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP-TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 5 FOR GUIDANCE.
- Q. 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.
- R. 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.
- S. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED, HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- T. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS SEE GENERAL NOTE "N" ABOVE.
- U. NOTICE: WHEN POSITIONING PALLETIZED UNITS IN A CAR, THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLETIZED 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 PALLETIZED 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.

(CONTINUED ON PAGE 3)

MATERIAL SPECIFICATIONS

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

- V. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY THE "STRUT BRACING" DETAIL ON PAGE 80. 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.
- W. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELLED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 80 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL-CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.
- X. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- Y. THE OUTLOADING PROCEDURES FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, HOWEVER, FIXED OR ADJUSTABLE WALL MEMBERS AND DOORWAY MEMBERS WITHIN THESE CARS MUST PROVIDE FOR THE INSTALLATION OF LOAD BLOCKING CROSS MEMBERS AT THE HEIGHTS SPECIFIED. CAUTION: BOX CARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
- 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).
 - CAUTION: ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT—ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- Z. IN A CAR EQUIPPED WITH ADJUSTABLE WALL MEMBERS, PROVIDING THE FIXED WALL MEMBERS WHICH ARE PRESENT IN SOME "ADJUSTABLE" CARS ARE NOT PROPERLY POSITIONED TO PROVIDE SIDE BEARING SURFACES BETWEEN THE UNITS AND THE CAR SIDEWALLS, ADJUSTABLE WALL MEMBERS (AS REQUIRED) MUST BE INSTALLED TO PROVIDE A MINIMUM OF ONE SURFACE AREA FOR SIDE BEARING AT SOME LOCATION WITHIN THE UPPER HALF OF EACH UNIT.
- AA. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

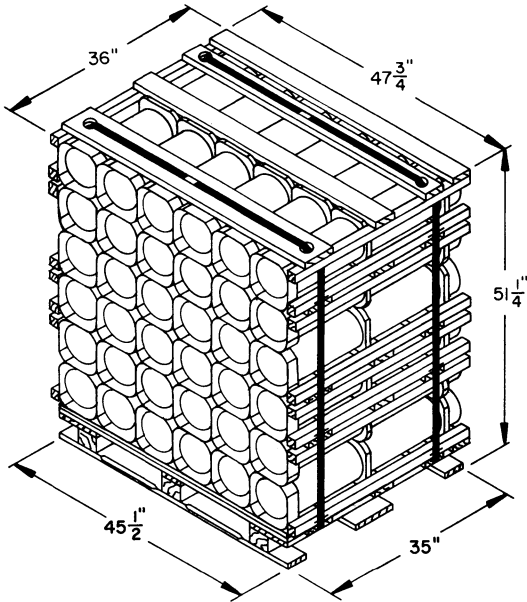
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- BB. CAUTION: FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER," WILL BE RBL, XL, OR XLI.
- (CONTINUED AT RIGHT)

- CC. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF PROPELLING CHARGES. NOTICE: ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.
- DD. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED; HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 86 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 86, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- EE. NOTICE: AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- FF. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "GG-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 85.
- GG. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLETIZED UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK ON CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, OR BY ADJUSTING THE NUMBER OF LOAD UNITS IN EITHER END OF THE CAR, ONE OF THE FOLLOWING PROCEDURES MUST BE USED IN ORDER TO OBTAIN THE DESIRED QUANTITY.
- ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGE 54 THRU 57.
 - 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 50 THRU 53 FOR GUIDANCE.
 - AT LOCATION (5) 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.
 - 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 68, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 64 AND 66.
- HH. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

NOTE:

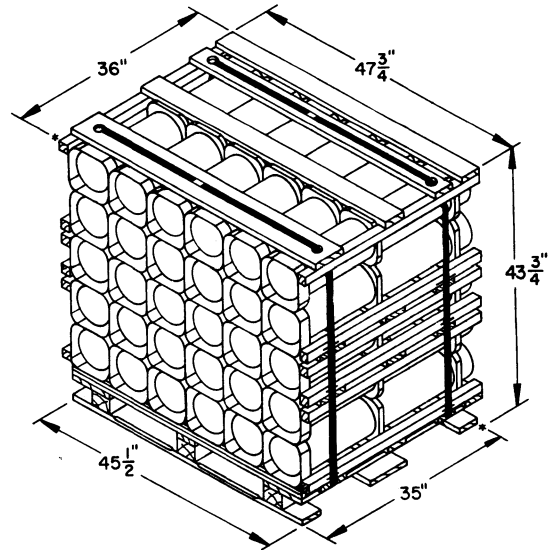
WHEN REFERRING TO THE PALLET UNIT LENGTH OR UNIT WIDTH, THE 35" DIMENSION OF THE PALLET BASE CONSTITUTES THE LENGTH AND THE 45-1/2" DIMENSION CONSTITUTES THE WIDTH.



6-LAYER PALLET UNIT (BASIC HEIGHT)

CONTAINER----- 36 EACH @ 52 LBS (APPROX)
 CUBE----- 50.9 CUBIC FEET (APPROX)
 GROSS WEIGHT----- 2,025 LBS (APPROX)

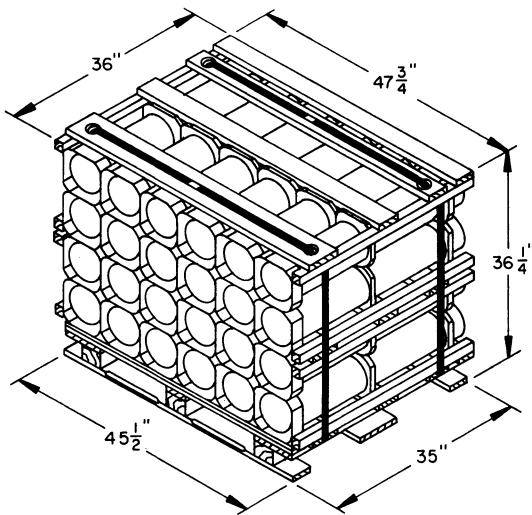
REFER TO PAGES 6 THRU 13 FOR OUTLOADING PROCEDURES



5-LAYER PALLET UNIT

CONTAINER----- 30 EACH @ 52 LBS (APPROX)
 CUBE----- 43.5 CUBIC FEET (APPROX)
 GROSS WEIGHT----- 1,697 LBS (APPROX)

REFER TO PAGES 18 THRU 25 FOR OUTLOADING PROCEDURES



4-LAYER PALLET UNIT

CONTAINER----- 24 EACH @ 52 LBS (APPROX)
 CUBE----- 36.06 CUBIC FEET (APPROX)
 GROSS WEIGHT----- 1,383 LBS (APPROX)

REFER TO PAGES 30 THRU 37 FOR OUTLOADING PROCEDURES



ONE SEAL WITH
TWO PAIR OF
NOTCHES.

STRAP JOINT A

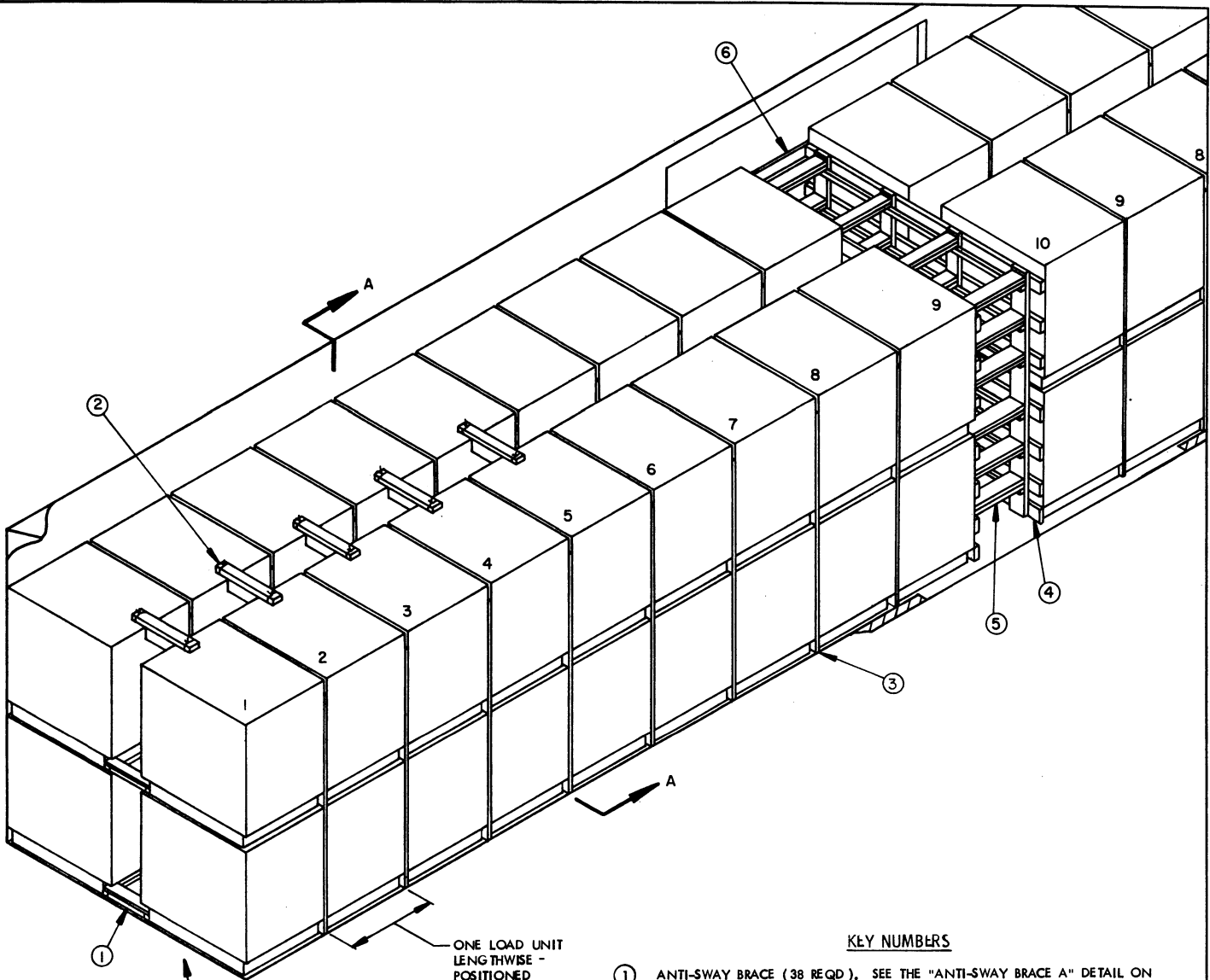
METHOD OF SECURING A
STRAP JOINT WHEN USING
A NOTCH-TYPE SEALER.



TWO SEALS, BUTTED
TOGETHER, WITH
TWO PAIR OF CRIMPS
EACH SEAL.

STRAP JOINT B

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



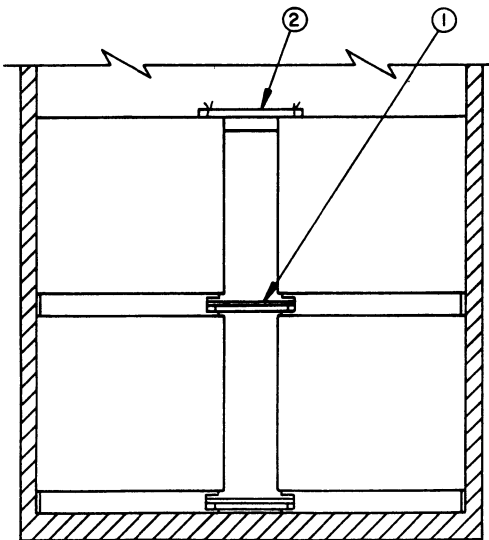
SEE GENERAL NOTES "D" AND "H" ON PAGE 2.

ONE LOAD UNIT LENGTHWISE - POSITIONED CONTAINERS.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (38 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTES 3 AND 12 ON PAGE 7.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 7.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (34 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED ① W/1-6d NAIL EACH. SEE SPECIAL NOTES 5 AND 6 ON PAGE 7.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 14. SEE SPECIAL NOTES 7 THRU 9 ON PAGE 7.
- ⑤ STRUT, 2" X 6" BY CUT TO FIT (REF: 31") (DOUBLED) (24 REQD). LAMINATE W/1-10d NAIL EVERY 6". TOENAIL TO PIECE MARKED ④ W/2-12d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3, AND SPECIAL NOTE 10 ON PAGE 7.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 14. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 11 AND 12 ON PAGE 7.



SECTION A-A

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

(SPECIAL NOTES CONTINUED)

- 13. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, REFER TO PAGES 47 THRU 70 FOR GUIDANCE.
- 14. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 72 FOR SHIPPING GUIDANCE.
- 15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

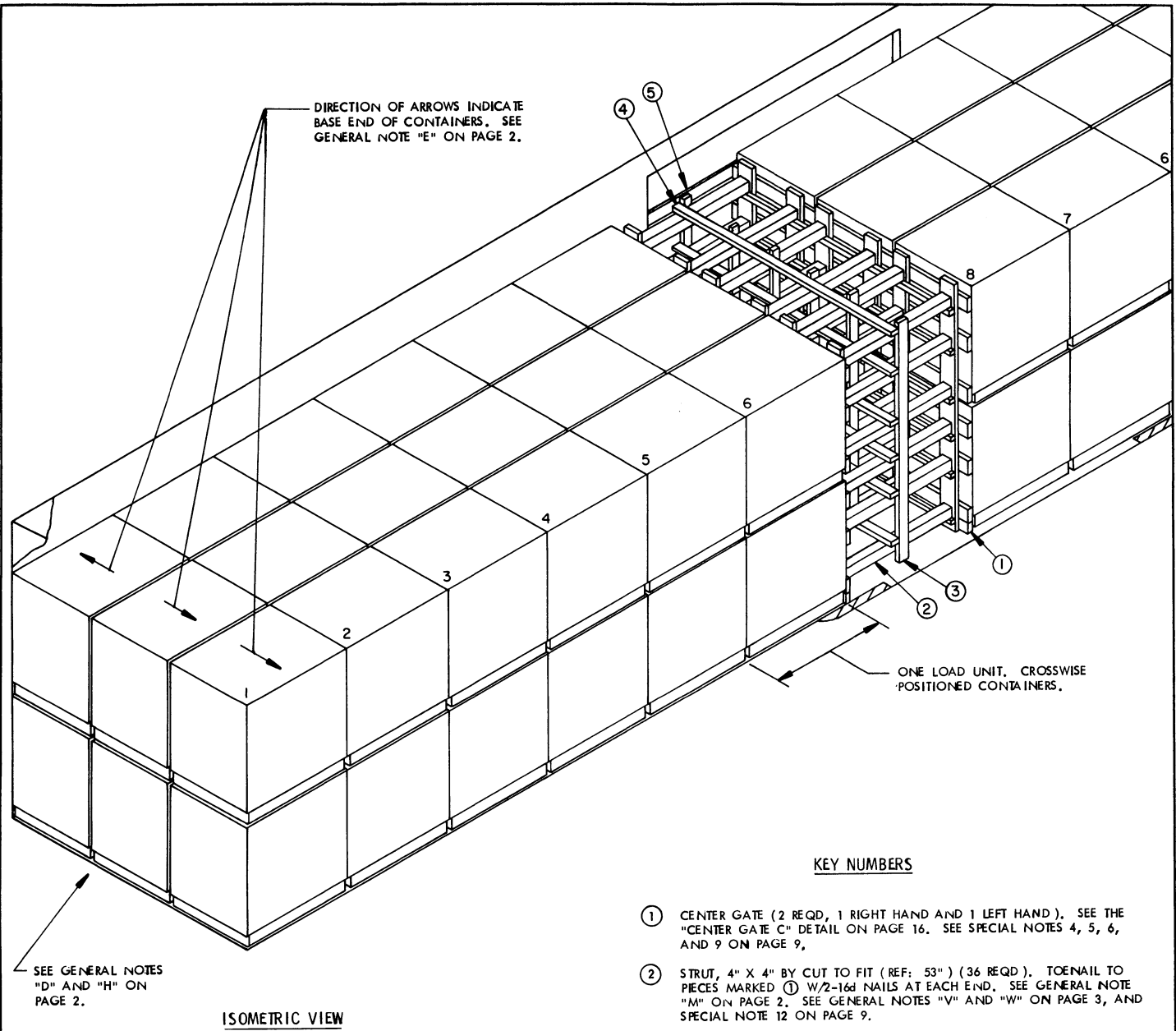
- 1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
- 2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 6 IS THE 6-LAYER (BASIC HEIGHT) UNIT. SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 121,500 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-EIGHT (48") UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 97,200 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
- 3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "A" AS SHOWN ON THE DETAIL ON PAGE 14.
- 4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 6, MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' CARS.
- 5. SEPARATOR GATES SHOWN AS PIECES MARKED ③ MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED; ALSO, THEY MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
- 6. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
- 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 A" DETAIL ON PAGE 77 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 ④ IN THE LOAD ON PAGE 6, CONSTRUCT TWO (2) CENTER GATES "B" AS SHOWN ON PAGE 15. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION A" DETAIL ON PAGE 79.
- 9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE A, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
- 10. IF THE DEPICTED LOAD CONTAINS NINE UNITS OR LESS IN EACH END OF THE CAR, 4" X 4" STRUTS MAY BE USED IN LIEU OF PIECES MARKED ⑤. NAIL AS DESCRIBED BY KEY NUMBER ② ON PAGE 8.
- 11. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑥ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.
- 12. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECE MARKED ⑦, USE PIECE MARKED ②, AND PIECES MARKED ④ THRU ⑥ ON PAGE 12. SEE SPECIAL NOTES 7 AND 8 ON PAGE 13 FOR GUIDANCE. TO PREVENT DAMAGE FROM LONGITUDINAL MOVEMENT DURING TRANSIT, A 4" X 4" NOTCH MUST BE CUT FROM THE CORNER OF SEPARATOR GATES WHICH ARE ADJACENT TO THE FLOORLINE BLOCKING, PIECE MARKED ④ ON PAGE 12.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	146	49
1" X 6"	80	40
2" X 2"	326	109
2" X 3"	40	20
2" X 4"	166	111
2" X 6"	318	318
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
6d (2")	572	3-1/2
10d (3")	568	8-3/4
12d (3-1/4")	62	1
16d (3-1/2")	96	2
PLYWOOD, 3/8" (34 SHEETS)-----1,088 SQ FT. REQD-----1,122 LBS		
WIRE, NO. 14, GAGE-----100' REQD-----2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	76	153,900 LBS
DUNNAGE		2,466 LBS
TOTAL WEIGHT		156,366 LBS (APPROX)



DIRECTION OF ARROWS INDICATE
BASE END OF CONTAINERS. SEE
GENERAL NOTE "E" ON PAGE 2.

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

ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "CENTER GATE C" DETAIL ON PAGE 16. SEE SPECIAL NOTES 4, 5, 6, AND 9 ON PAGE 9.
- ② STRUT, 4" X 4" BY CUT TO FIT (REF: 53") (36 REQD). TOENAIL TO PIECES MARKED ① W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3, AND SPECIAL NOTE 12 ON PAGE 9.
- ③ VERTICAL STRUT BRACING, 2" X 4" X 8'-3" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ④ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 16. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 7 AND 8 ON PAGE 9.

ONE LOAD UNIT, CROSSWISE
POSITIONED CONTAINERS.

6-LAYER PALLET UNIT

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

(SPECIAL NOTES CONTINUED)

- 11. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) 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. ALSO, A 2-TIER LOAD CAN BE REDUCED BY FOURTEEN (14) UNITS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 44, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 46 THRU 71 FOR GUIDANCE.
- 12. IF THE DEPICTED LOAD CONTAINS SIX UNITS OR LESS IN EACH END OF THE CAR, FOUR (4) STRUTS WILL BE REQUIRED PER ROW/TIER; THEN, THE HORIZONTAL PIECES AND STRUT LEDGERS SHOWN BY THE PHANTOM LINES ON THE DETAIL ON PAGE 16 WILL BE OMITTED.
- 13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 71 AND 74 FOR SHIPPING GUIDANCE.
- 14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

- 1. A 60'-8" LONG BY 9'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 10.
- 2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 8 IS THE 6-LAYER UNIT. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 145,800 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FIFTY-FOUR (54) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 109,350 POUNDS, CAN BE OUT-LOADED IN A 40'-6" LONG CAR.
- 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 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. 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 B" DETAIL ON PAGE 77 FOR GUIDANCE.
- 5. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT ON 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 ① IN THE LOAD ON PAGE 8, INSTALL TWO (2) "CENTER GATES K", AND TWO (2) "CENTER GATES L" AS SHOWN ON PAGE 78. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION B" DETAIL ON PAGE 79.
- 6. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATE "C", PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
- 7. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED ⑤ IN THE LOAD ON PAGE 8 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.
- 8. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED IN LIEU OF THE WOODEN GATE TYPE MARKED ⑤, REFER TO KEY NUMBERS ③ THRU ⑥ ON PAGE 36, AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR GUIDANCE.
- 9. IF SPECIAL NOTE 8 APPLIES, STOP PIECES MUST BE APPLIED TO CENTER GATE "C" IN THE DOORWAY TO PREVENT DISPLACEMENT, AS SHOWN BY THE "CENTER GATE C" DETAIL ON PAGE 16. IF SPLIT CENTER GATES "K" AND "L" ARE USED, EXTEND THE LENGTH OF THE SIDE BLOCKING NINE INCHES (9") BEYOND THE GATES TO PREVENT DISPLACEMENT.
- 10. IF THE CAR TO BE LOADED IS MORE THAN 9'-2" WIDE, THE HIGH "CRIB FILL A" DETAILED ON PAGE 15, MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD IN 40' AND 50' CARS. FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR; USE "CRIB FILL B" DETAILED ON PAGE 15 FOR THE BALANCE OF THE LOAD. SEE KEY NUMBERS ① AND ② ON PAGE 36 AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR INSTALLATION GUIDANCE. IF DESIRED, IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT THE HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION IN LIEU OF USING THE SPECIFIED CRIB FILL. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED THREE INCHES (3").

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	106	36
2" X 3"	38	19
2" X 4"	109	73
2" X 6"	214	214
4" X 4"	159	212
NAILS	NO. REQD	POUNDS
6d (2")	48	1/4
10d (3")	472	7-1/4
12d (3-1/4")	32	3/4
16d (3-1/2")	144	3-1/4

LOAD AS SHOWN

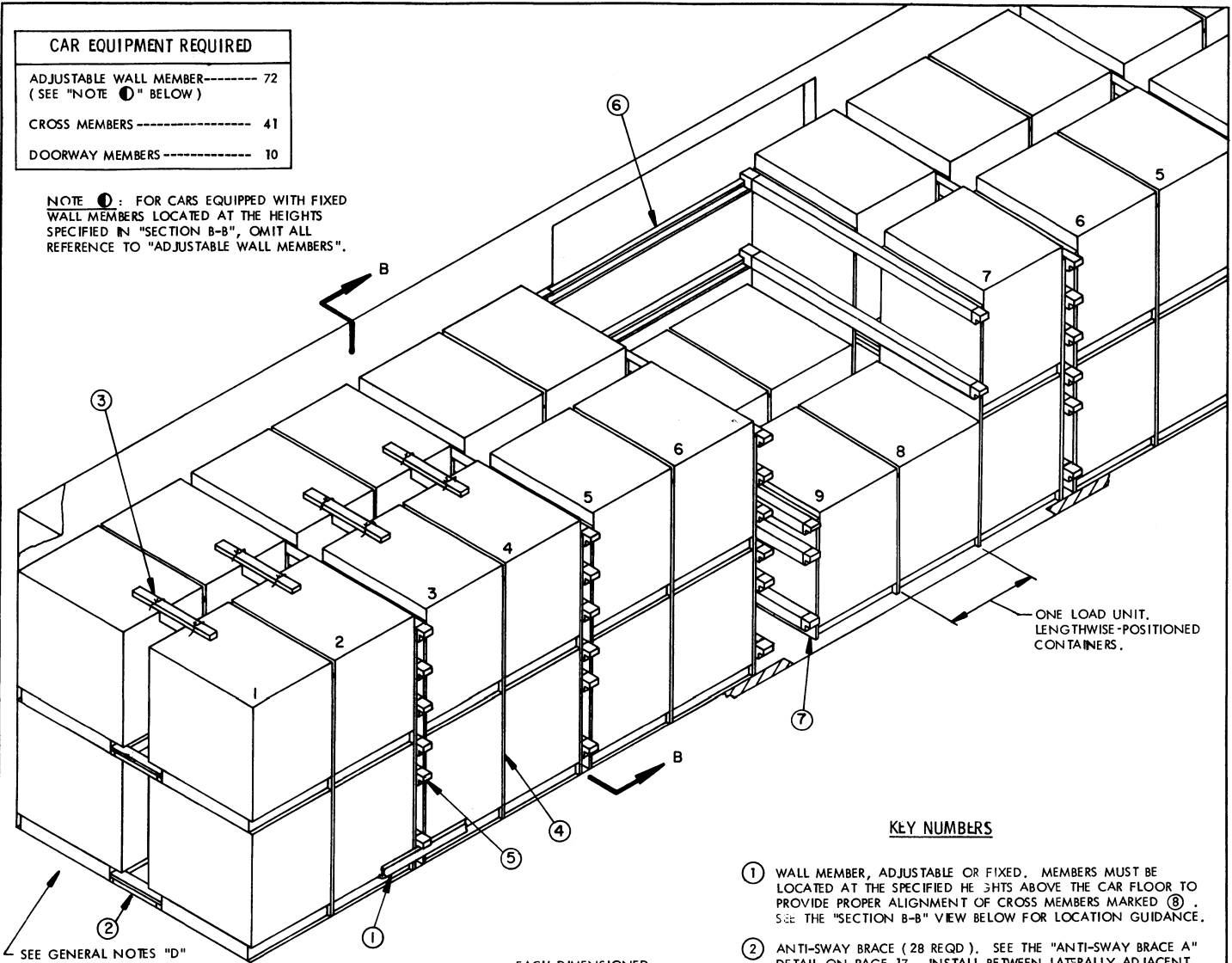
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	84	170,100 LBS
DUNNAGE		1,200 LBS
TOTAL WEIGHT		171,300 LBS (APPROX)

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

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER-----	72
(SEE "NOTE 1" BELOW)	
CROSS MEMBERS-----	41
DOORWAY MEMBERS-----	10

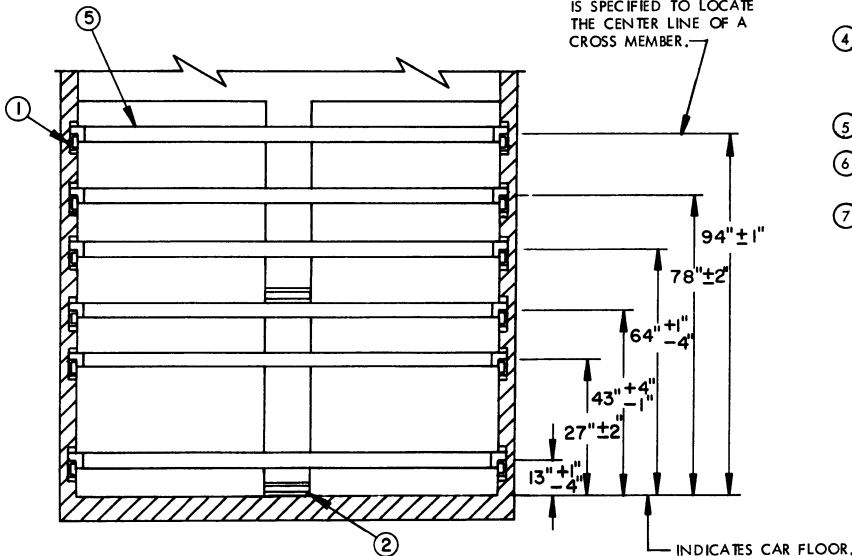
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION B-B", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTES "D" AND "H" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.

ISOMETRIC VIEW

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 B-B

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 B-B" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 11.
- 4 SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (36 REQD). POSITION AGAINST UNIT. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED 2 W/1-6d NAIL EACH. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 11.
- 5 CROSS MEMBER (41 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- 6 DOORWAY MEMBER (10 REQD). SEE THE "SECTION B-B" VIEW AT LEFT FOR GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 11.
- 7 SEPARATOR GATE, 3/8" PLYWOOD, 4' X 4' SHEET (4 REQD). NAIL TO THE ANTI-SWAY BRACES MARKED 2 W/1-6d NAIL EACH.

6-LAYER PALLET UNIT

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

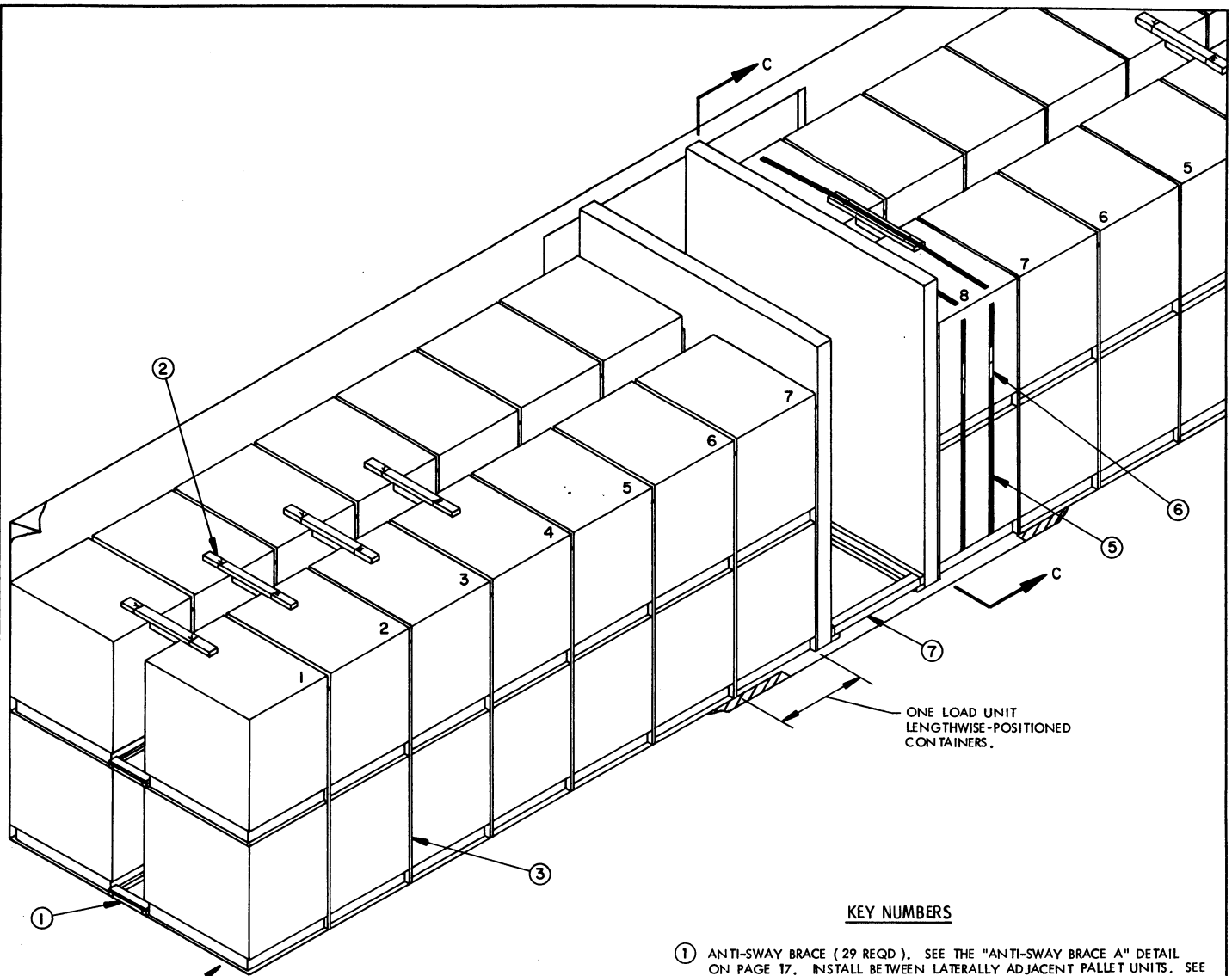
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED 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 PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 10 IS THE 6-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF FORTY (40) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 81,000 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR.
3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE CONSTRUCTED THE SAME AS THE "END-WALL LINING" DETAILED ON PAGE 75 MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. TOP-OF-LOAD ANTI-SWAY BRACES SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 10 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF THE LOAD REGARDLESS OF THE CAR LENGTH.
5. IF DESIRED, SEPARATOR GATES SHOWN AS PIECES MARKED ④ AND ⑦ MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
6. SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8" IF DESIRED.
7. SEPARATOR GATES, SHOWN AS PIECES MARKED ④ AND ⑦ MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. FOR SEPARATOR GATES WHICH ARE ADJACENT TO THE CROSS MEMBERS REFER TO THE "SEPARATOR GATE A" DETAIL ON PAGE 17. FOR SEPARATOR GATES WHICH ARE NOT ADJACENT TO THE CROSS MEMBERS, REFER TO THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
8. IF THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AN ADDITIONAL FOUR (4) PALLET UNITS CAN BE LOADED IN THE DOORWAY AREA.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD CAN BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE CENTER PORTION OF THE LOAD, OR FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGE 42 AND 43 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	94	32
2" X 2"	168	56
2" X 4"	104	70
4" X 4"	9	12
NAILS	NO. REQD	POUNDS
6d (2")	412	2-1/2
10d (3")	112	1-3/4
12d (3-1/4")	24	1/2
PLYWOOD, 3/8" (38 SHEETS)-----1,216' SQ FT REQD-----1,254 LBS		
WIRE, NO. 14 GAGE-----80' REQD-----2 LBS		

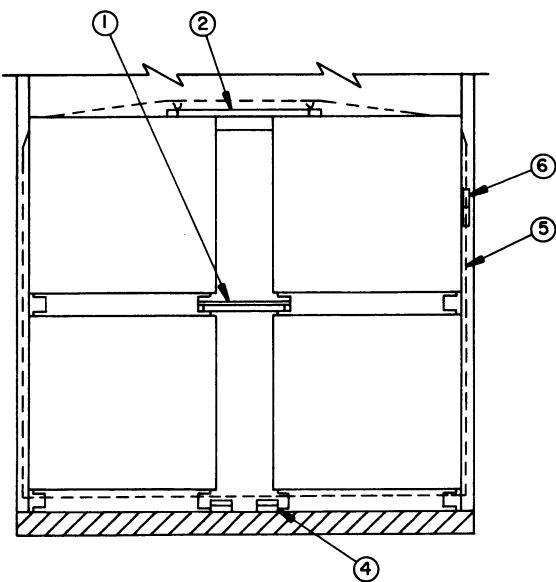
LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	56-----	113,400 LBS
DUNNAGE-----	-----	1,600 LBS
TOTAL WEIGHT-----		115,000 LBS (APPROX)



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

ISOMETRIC VIEW



SECTION C-C

KEY NUMBERS

- ① ANTI-SWAY BRACE (29 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 7 ON PAGE 13.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 3 ON PAGE 13.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (30 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACE MARKED ① W/1-6d NAIL EACH. SEE SPECIAL NOTES 4 AND 5 ON PAGE 13.
- ④ FLOORLINE BLOCKING, 2" X 6" X 36" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 6 AND 7 ON PAGE 13.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .081" OR .035" X 36'-6" LONG STEEL STRAPPING (2 REQD). THREAD STRAP THRU HOLES ON TOP DUNNAGE ASSEMBLY, STAPLE TO THE TOP-OF-LOAD ANTI-SWAY BRACE W/2 STAPLES. SEE SPECIAL NOTE 8 ON PAGE 13.
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑦ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 85. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 9 ON PAGE 13.

ONE LOAD UNIT
LENGTHWISE-POSITIONED
CONTAINERS.

(SPECIAL NOTES CONTINUED)

9. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED (7) IN THE LOAD ON PAGE 12, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD, THE STRUT ASSEMBLY WOULD NOT BE REQUIRED IF THE LOAD CONSISTED OF SIX (6) LOAD UNITS IN EACH END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 50' OR LONGER CARS.
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) 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 48 THRU 57 AND GENERAL NOTE "GG" 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 71 AND/OR PAGES 72 AND 74 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 12 IS THE 6-LAYER (BASIC HEIGHT) UNIT. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 145,800 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF FORTY-EIGHT (48) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 97,200 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE CROSS-WISE LOADING PATTERN ON PAGE 8 IS EMPLOYED, EIGHTY-FOUR (84) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 170,100 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, SIXTY-EIGHT (68) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 137,700 POUNDS, AND FORTY-EIGHT (48) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 97,200 POUNDS.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 12 MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' CARS.
4. SEPARATOR GATES SHOWN AS PIECES MARKED (3) MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED; ALSO, THEY MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
5. SEPARATOR GATES, SHOWN AS PIECE MARKED (3) MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. REFER TO THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
6. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (6) IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.
7. FLOORLINE BLOCKING SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 12, MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE MARKED (1), FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS; IF THE PALLET UNITS ARE POSITIONED CROSSWISE, REFER TO KEY NUMBERS (3) THRU (6) ON PAGE 36, AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR GUIDANCE.
8. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	112	38
2" X 2"	174	58
1" X 8"	17	12
2" X 4"	159	106
2" X 6"	12	12
4" X 4"	23	31
NAILS	NO. REQD	POUNDS
6d (2")	424	2-1/2
10d (3")	132	2
12d (3-1/4")	40	3/4
16d (3-1/2")	16	1/2
PLYWOOD, 3/8" (30 SHEETS)-----	960 SQ FT REQD-----	990 LBS
STEEL STRAPPING, 1-1/4"-----	73' REQD-----	11 LBS
SEAL FOR 1-1/4" STRAPPING-----	4 REQD-----	NIL
STAPLE FOR 1-1/4" STRAPPING-----	4 REQD-----	NIL
WIRE, NO. 14 GAGE-----	80' REQD-----	1 LB

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	60-----	121,500 LBS
DUNNAGE-----	-----	1,522 LBS
TOTAL WEIGHT-----	-----	123,022 LBS (APPROX)

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

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

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

8'-2"

67"

46"

16"

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

DOORWAY PROTECTION A

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

STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 12-1/2" IN LENGTH (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

CAR WIDTH MINUS 1/2"

STOP PIECE, 2" X 4" BY A LENGTH TO SUIT (1 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 7.

8'-6"

7'-9 1/2"

6'-5 1/2"

62 1/2"

4 1/2"

26 1/2"

11 1/2"

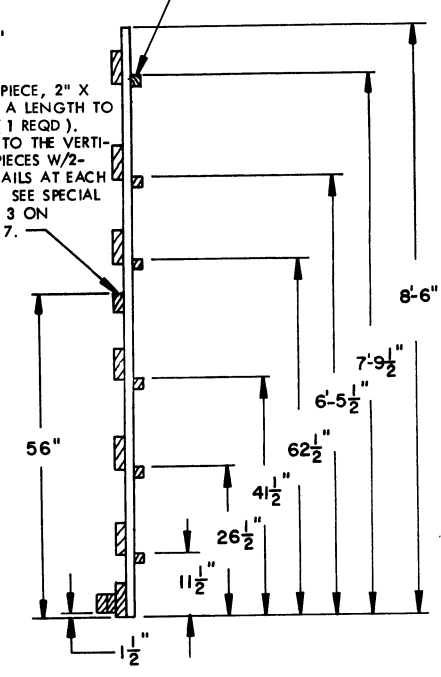
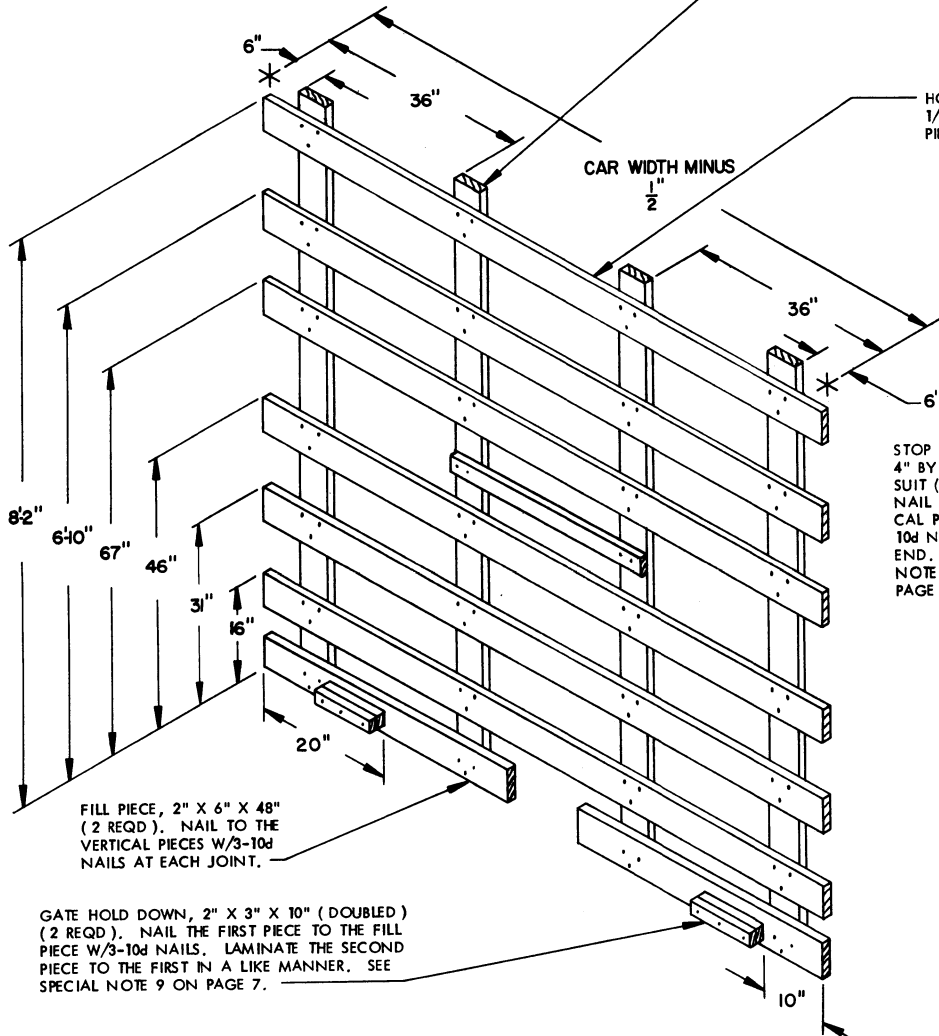
1 1/2"

FILL PIECE, 2" X 6" X 48" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

GATE HOLD DOWN, 2" X 3" X 10" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FILL PIECE W/3-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 9 ON PAGE 7.

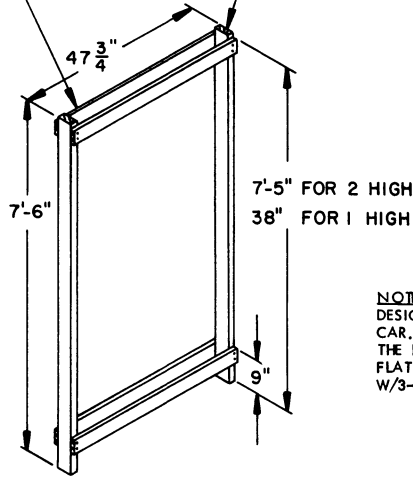
CENTER GATE A

END VIEW



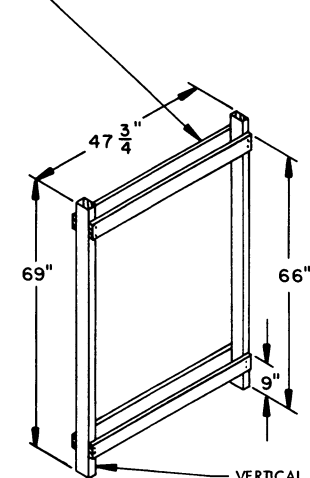
HORIZONTAL PIECE, 1" X 4" X 47-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH END.

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



CRIB FILL A

HORIZONTAL PIECE, 1" X 4" X 47-3/4" (4 REQD). NAIL TO VERTICAL PIECES W/2-6d NAILS AT EACH END.

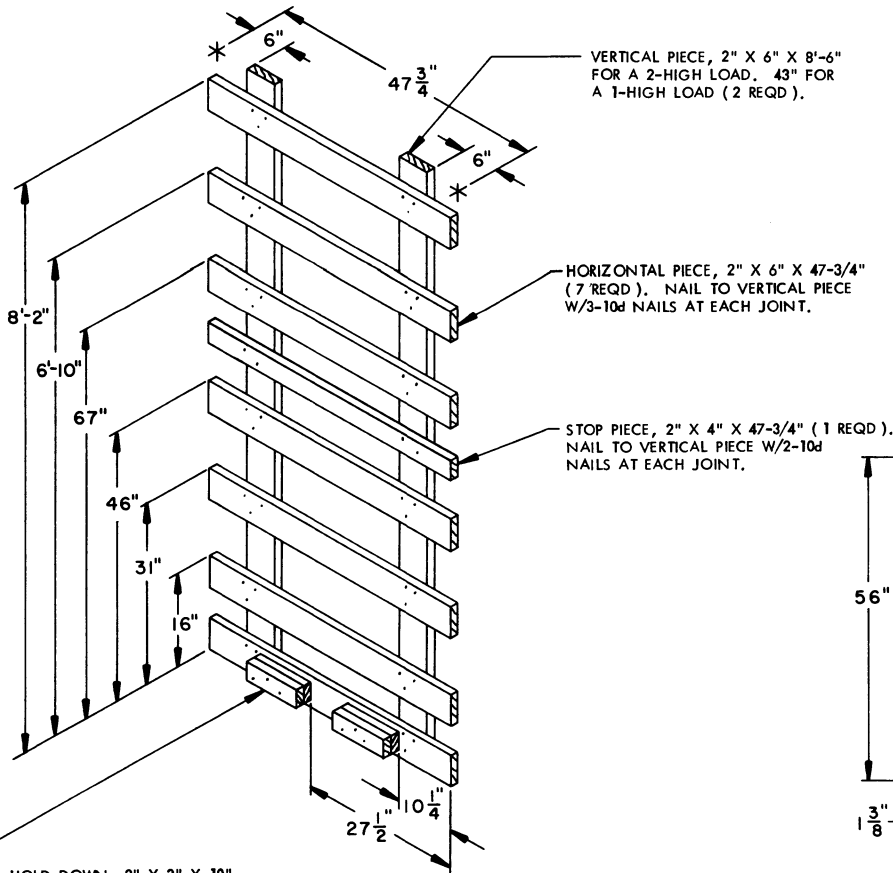


CRIB FILL B

NOTE: THE DEPICTED CRIB FILL IS DESIGNED FOR USE IN A 9'-6" WIDE CAR. IF THE CAR IS 9'-4", NAIL THE HORIZONTAL PIECES TO THE FLAT SIDE OF THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

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

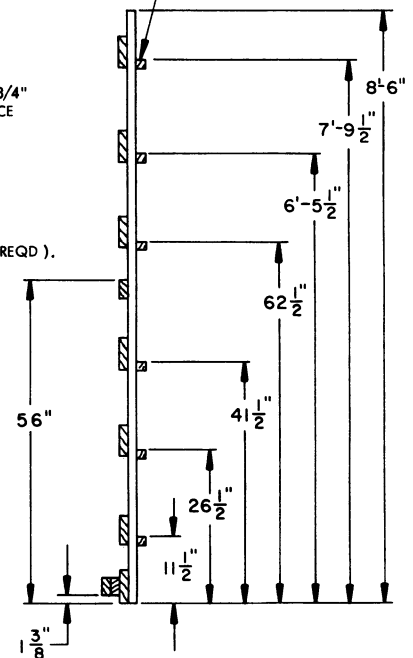
CRIB FILL "B" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "A" THROUGHOUT THE LENGTH OF LOAD.



CENTER GATE B

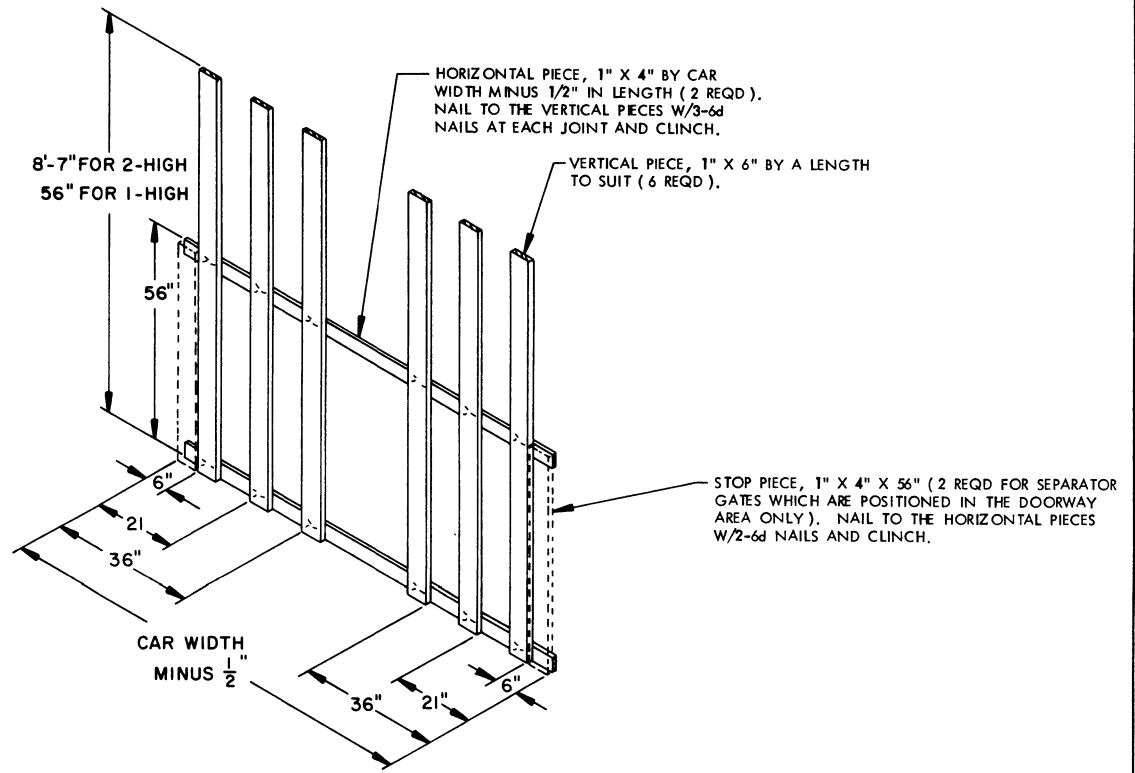
GATE HOLD DOWN, 2" X 3" X 10" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE BOTTOM HORIZONTAL PIECE W/3-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 8 ON PAGE 7.

STRUT LEDGER, 2" X 2" OR 2" X 4" X 36" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



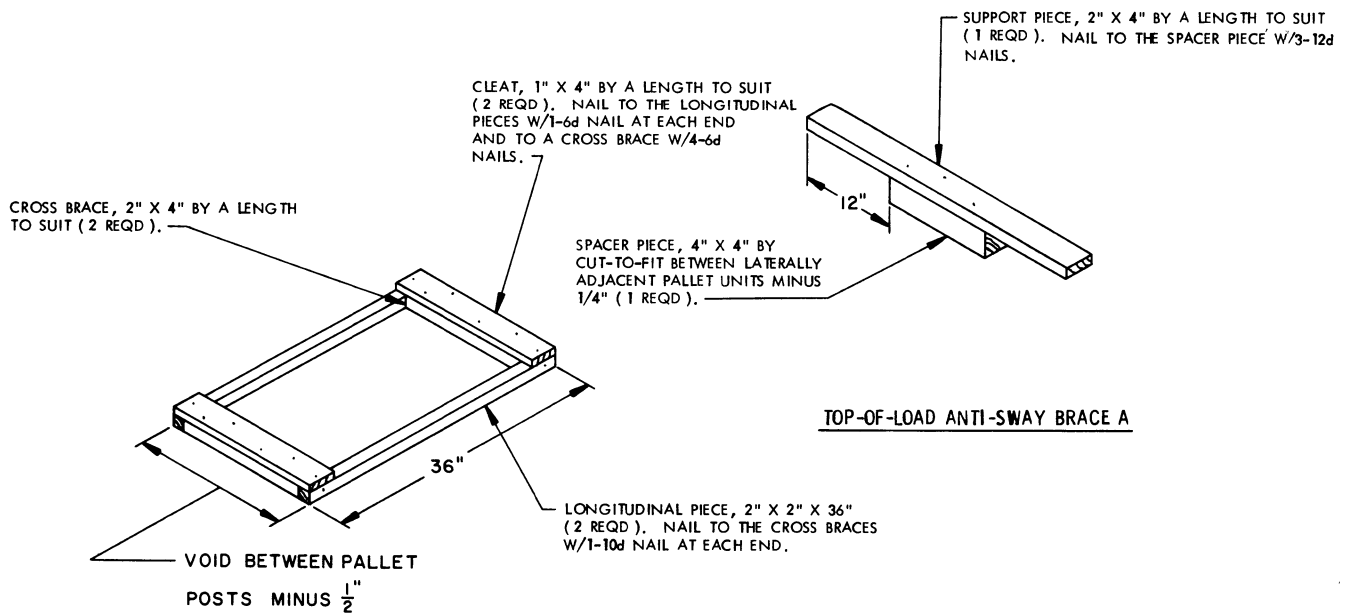
END VIEW

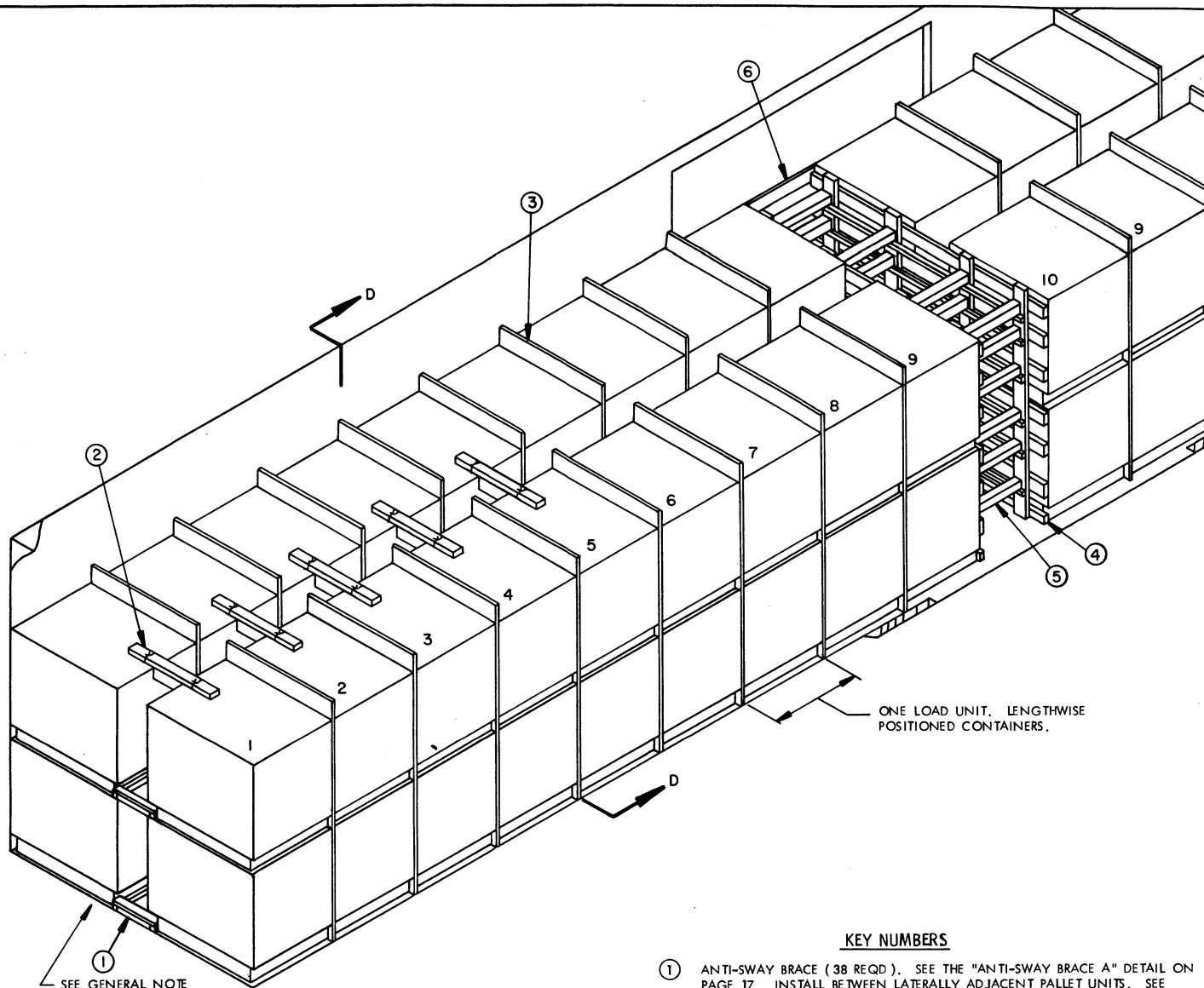
DETAILS FOR 6-LAYER PALLET UNIT



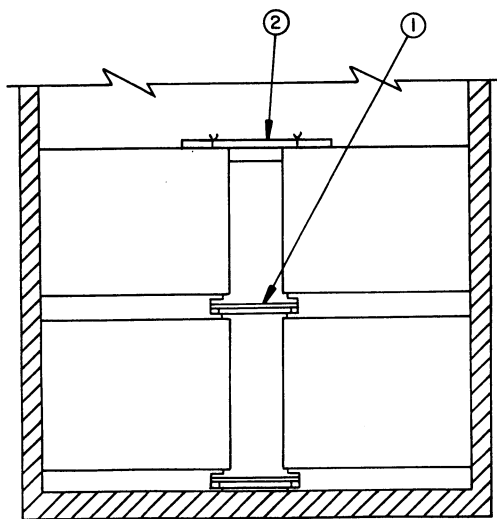
SEPARATOR GATE A

POSITION SEPARATOR GATE AT EACH CROSS MEMBER LOCATION WITH THE VERTICAL PIECES AGAINST THE UNITS.





ISOMETRIC VIEW



SECTION D-D

CENTER GATE, PIECE MARKED ④, OMITTED FOR CLARITY

KEY NUMBERS

- ① ANTI-SWAY BRACE (38 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTES 3 AND 11 ON PAGE 19.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 19.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (34 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED ① W/1-6d NAIL EACH. SEE SPECIAL NOTES 5, 6, AND 11 ON PAGE 19.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 26. SEE SPECIAL NOTES 7 THRU 9 ON PAGE 19.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 31") (24 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ⑥ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 26. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 10 AND 11 ON PAGE 19.

5-LAYER PALLET UNIT

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

(SPECIAL NOTES CONTINUED)

11. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECE MARKED (6), USE PIECE MARKED (2), AND PIECES MARKED (4) THRU (6) ON PAGE 12. SEE SPECIAL NOTES 7 AND 8 ON PAGE 13 FOR GUIDANCE. TO PREVENT DAMAGE FROM LONGITUDINAL MOVEMENT DURING TRANSIT, A 4" X 4" NOTCH MUST BE CUT FROM THE CORNER OF SEPARATOR GATES WHICH ARE ADJACENT TO THE FLOORLINE BLOCKING, PIECE MARKED (4) ON PAGE 12.
12. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 47 THRU 70 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 72 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

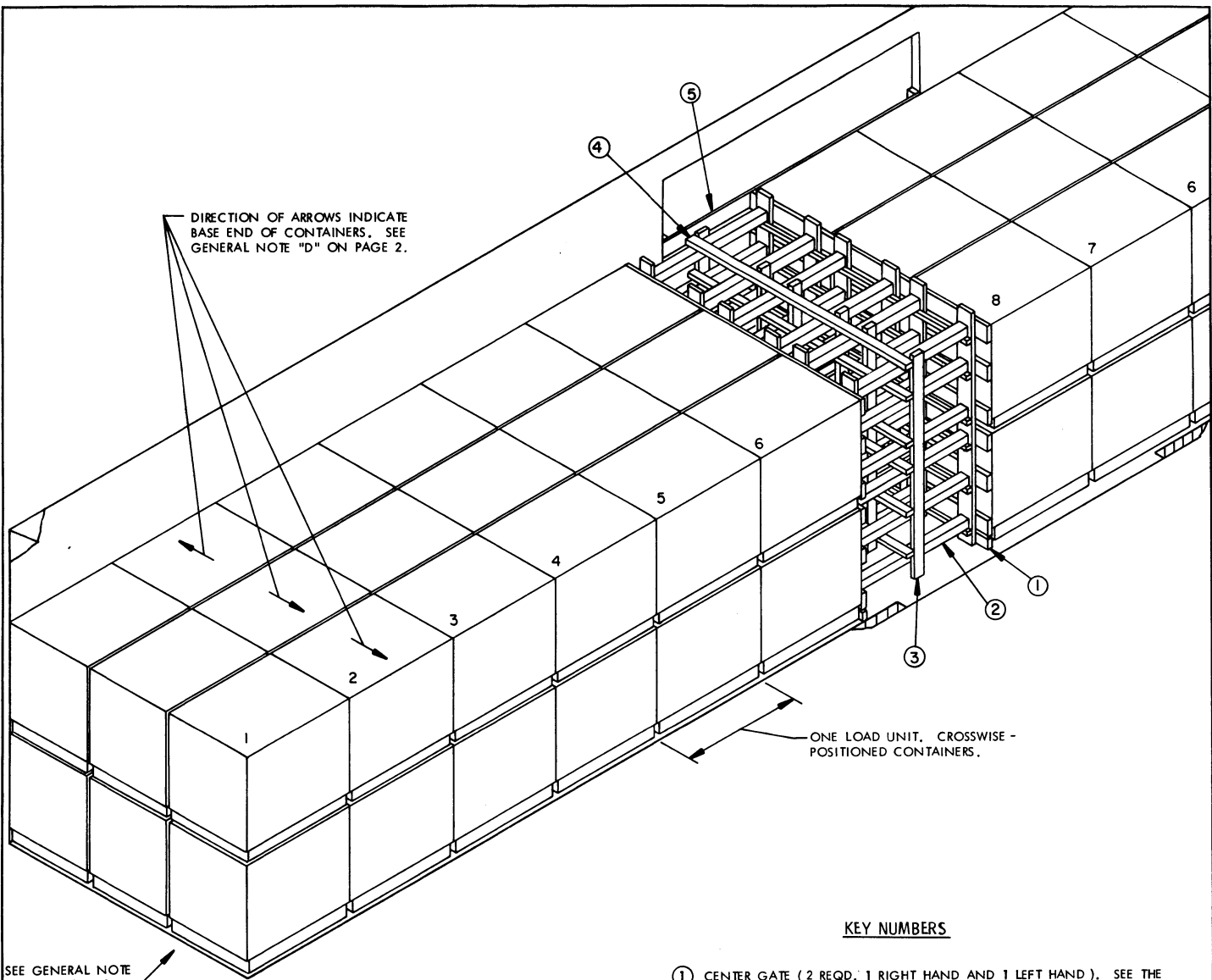
1. A 60' LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 18 IS THE 5-LAYER UNIT. A MAXIMUM OF SIXTY (60) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 101,820 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FORTY-EIGHT (48) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 81,456 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS. TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "D" AS SHOWN ON THE DETAIL ON PAGE 26.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 18, MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' CARS.
5. SEPARATOR GATES SHOWN AS PIECES MARKED (3) MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED; ALSO, THEY MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
6. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
7. 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 A" DETAIL ON PAGE 77 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 D" SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 18, CONSTRUCT TWO (2) CENTER GATES "E" AS SHOWN ON PAGE 27. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION A" DETAIL ON PAGE 79.
9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE D, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
10. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE UNIT LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (6) IN THE LOAD ON PAGE 18 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	146	49
1" X 6"	80	40
2" X 2"	326	109
2" X 3"	36	18
2" X 4"	166	111
2" X 6"	186	186
4" X 4"	74	99
NAILS	NO. REQD	POUNDS
6d (2")	572	3-1/2
10d (3")	448	7
12d (3-1/4")	62	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE-----100' REQD-----2 LBS		
PLYWOOD, 1/2"-----1,088 SQ FT REQD-----1,122 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	76	128,972 LBS
DUNNAGE		2,361 LBS
TOTAL WEIGHT		131,333 LBS (APPROX)



DIRECTION OF ARROWS INDICATE
BASE END OF CONTAINERS. SEE
GENERAL NOTE "D" ON PAGE 2.

SEE GENERAL NOTE
"H" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE (2 REQD.; 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "CENTER GATE F" DETAIL ON PAGE 28. SEE SPECIAL NOTES 4, 5, 6, AND 9 ON PAGE 21.
- ② STRUT, 4" X 4" BY CUT TO FIT (REF: 53") (36 REQD.). TOENAIL TO PIECES MARKED 1 W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3, AND SPECIAL NOTE 11 ON PAGE 21.
- ③ VERTICAL STRUT BRACING, 2" X 4" X 7'-6" (6 REQD.). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ④ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 6" (6 REQD.). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑤ DOORWAY PROTECTION (2 REQD.). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 28. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 7 AND 8 ON PAGE 21.

(SPECIAL NOTES CONTINUED)

11. IF THE DEPICTED LOAD CONTAINS SEVEN UNITS OR LESS IN EACH END OF THE CAR, FOUR (4) STRUTS WILL BE REQUIRED PER ROW/TIER; THEN, THE HORIZONTAL PIECES AND STRUT LEDGERS SHOWN BY THE PHANTOMED LINES ON THE DETAIL ON PAGE 28 WILL BE OMITTED.
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 SIX (6) 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. ALSO, A 2-TIER LOAD CAN BE REDUCED BY FOURTEEN (14) UNITS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 44, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 46 THRU 69 FOR GUIDANCE.
13. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 71 AND 74 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 10.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 20 IS THE 5-LAYER UNIT. A MAXIMUM OF FIFTY-FOUR (54) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 91,638 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; SEVENTY-TWO (72) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 122,184 POUNDS, CAN BE OUT-LOADED IN A 50'-6" LONG CAR.
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 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. 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 B" DETAIL ON PAGE 77 FOR GUIDANCE.
5. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT ON 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 (1) IN THE LOAD ON PAGE 20, INSTALL TWO (2) "CENTER GATES K", AND TWO (2) "CENTER GATES L" AS SHOWN ON PAGE 78. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION B" DETAIL ON PAGE 79.
6. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATE "F", PROVIDING THE CAR HAS AVAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
7. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (5) IN THE LOAD ON PAGE 20 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND AVAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE U.S.D.
8. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED IN LIEU OF THE WOODEN GATE TYPE MARKED (5), REFER TO KEY NUMBERS (3) THRU (6) ON PAGE 36, AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR GUIDANCE.
9. IF SPECIAL NOTE 8 APPLIES, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" PIECE POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE TWO CENTER VERTICAL PIECES OF A CENTER GATE. TWO (2) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING.
10. IF THE CAR TO BE LOADED IS MORE THAN 9'-2" WIDE, THE HIGH "CRIB FILL C" DETAILED ON PAGE 27 MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD IN 40' AND 50' CARS, FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR; USE "CRIB FILL D" DETAILED ON PAGE 27 FOR THE BALANCE OF THE LOAD. SEE KEY NUMBERS (1) AND (2) ON PAGE 36 AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR INSTALLATION GUIDANCE. IF DESIRED, IN CARS HAVING AVAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT THE HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION IN LIEU OF USING THE SPECIFIED CRIB FILL. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED THREE INCHES (3").

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	101	34
2" X 3"	32	16
2" X 4"	109	73
2" X 6"	200	200
4" X 4"	159	212
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	624	9-3/4
12d (3-1/4")	24	1/2
16d (3-1/2")	144	3-1/4

LOAD AS SHOWN

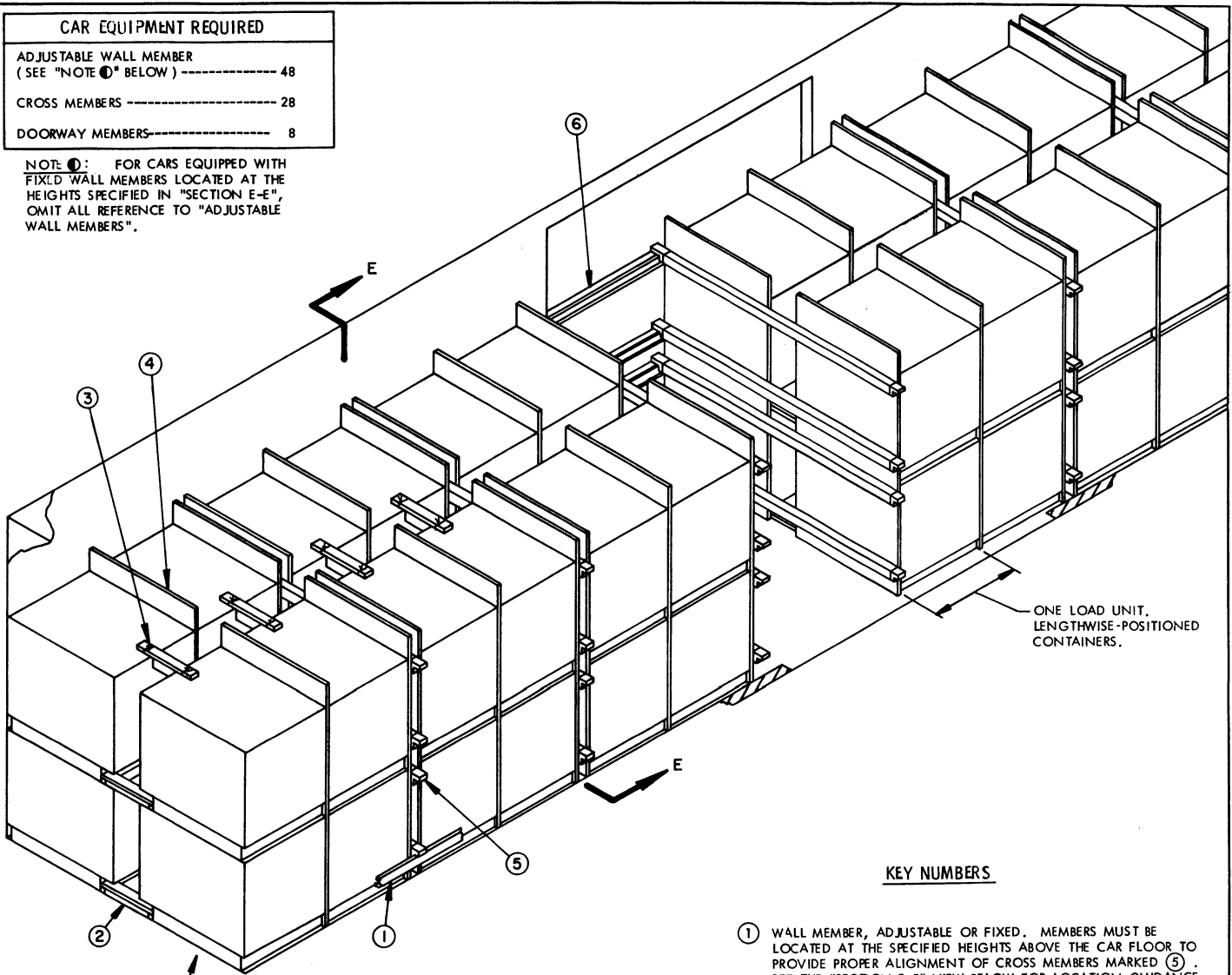
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	84-----	142,548 LBS
DUNNAGE-----	-----	1,164 LBS
TOTAL WEIGHT-----		143,712 LBS (APPROX)

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

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER (SEE "NOTE 1" BELOW) -----	48
CROSS MEMBERS -----	28
DOORWAY MEMBERS -----	8

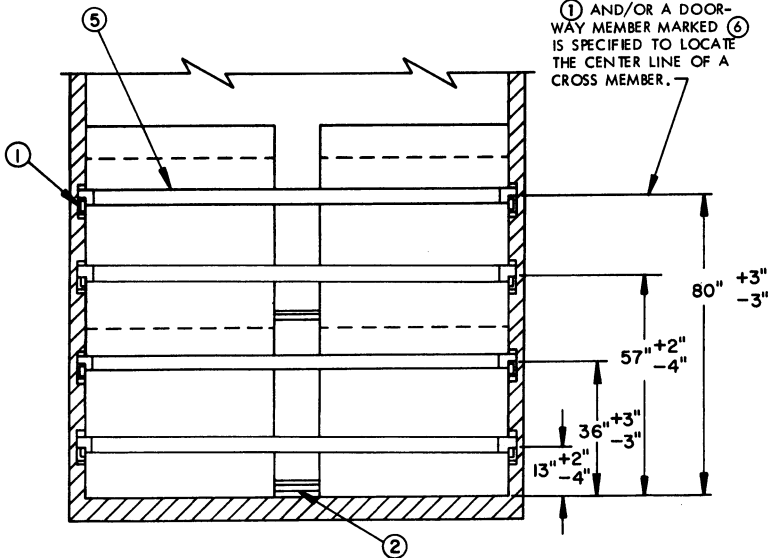
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION E-E", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTES "D" AND "H" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 23.

ISOMETRIC VIEW

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 E-E

KEY NUMBERS

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 5. SEE THE "SECTION E-E" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (28 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 23.
- 4 SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (38 REQD). POSITION AGAINST UNIT. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED 2 W/1-6d NAIL EACH. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 23.
- 5 CROSS MEMBER (28 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- 6 DOORWAY MEMBER (8 REQD). SEE THE "SECTION E-E" VIEW ABOVE FOR GUIDANCE.

5-LAYER PALLET UNIT

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

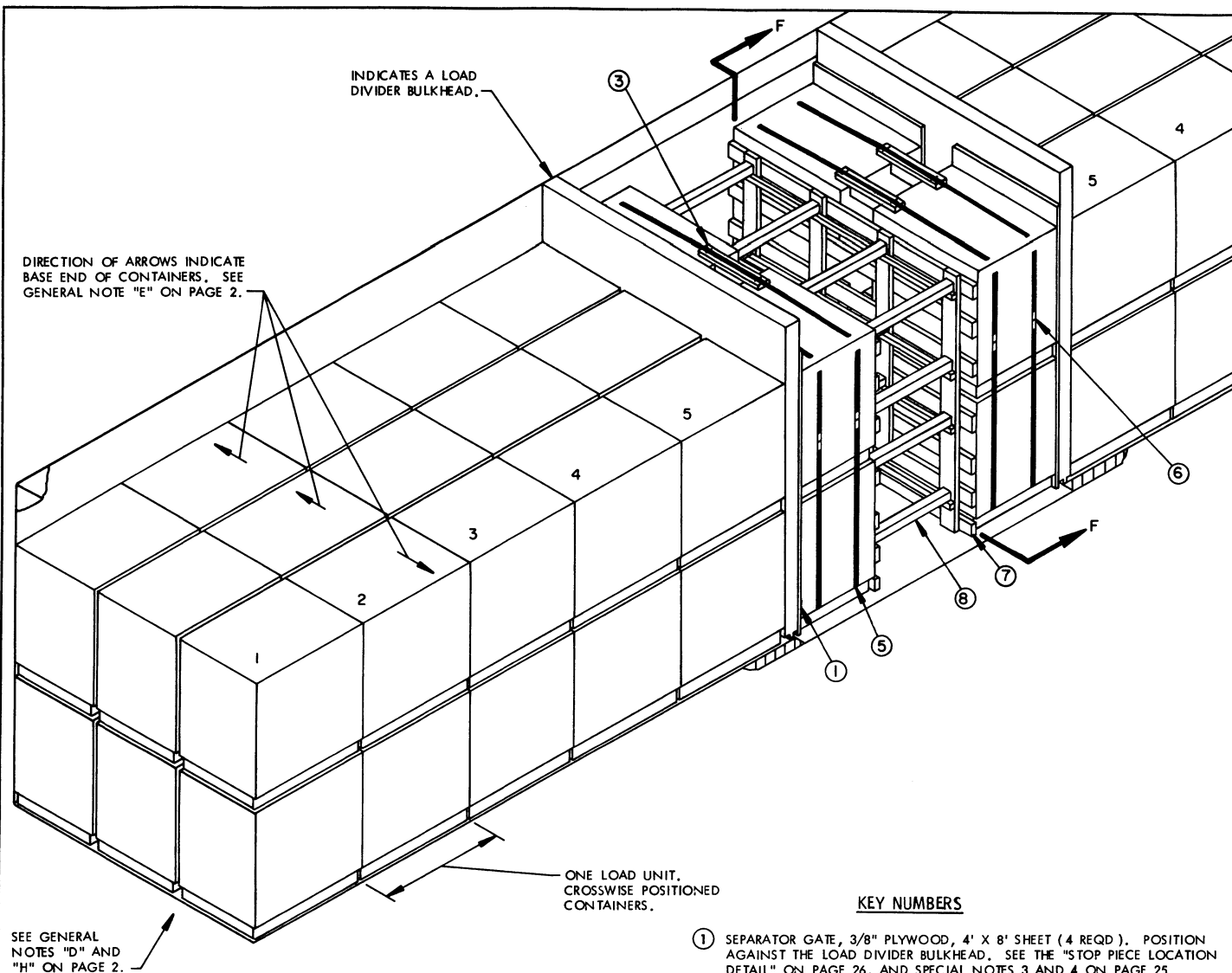
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 22 IS THE 5-LAYER UNIT. A MAXIMUM OF FORTY (40) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 67,880 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR. SEE SPECIAL NOTE 8.
3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE CONSTRUCTED THE SAME AS THE "END WALL LINING" DETAILED ON PAGE 75 MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. TOP-OF-LOAD ANTI-SWAY BRACES SHOWN AS PIECES MARKED (3) IN THE LOAD ON PAGE 22 MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF THE LOAD REGARDLESS OF THE CAR LENGTH.
5. IF DESIRED, SEPARATOR GATES SHOWN AS PIECES MARKED (4) MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
6. SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED.
7. SEPARATOR GATES, SHOWN AS PIECES MARKED (4) MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. FOR SEPARATOR GATES WHICH ARE ADJACENT TO THE CROSS MEMBERS, REFER TO THE "SEPARATOR GATE B" DETAIL ON PAGE 29. FOR SEPARATOR GATES WHICH ARE NOT ADJACENT TO THE CROSS MEMBERS, REFER TO THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
8. NOTE THAT FOUR (4) ADDITIONAL PALLET UNITS CAN BE POSITIONED IN THE DOORWAY AREA OF THE CAR, PROVIDING THE WEIGHT CAPACITY FOR THE CAR IS NOT EXCEEDED.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD CAN BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS, OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGE 42 AND 43 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	94	32
2" X 2"	168	56
2" X 4"	104	70
4" X 4"	9	12
NAILS	NO. REQD	POUNDS
6d (2")	412	2-1/2
10d (3")	112	2
12d (3-1/2")	24	1/2
PLYWOOD, 3/8" (38 SHEETS)-----1,216' SQ FT REQD---1,254 LBS		
WIRE, NO. 14 GAGE-----80' REQD----- 2 LBS		

LOAD AS SHOWN

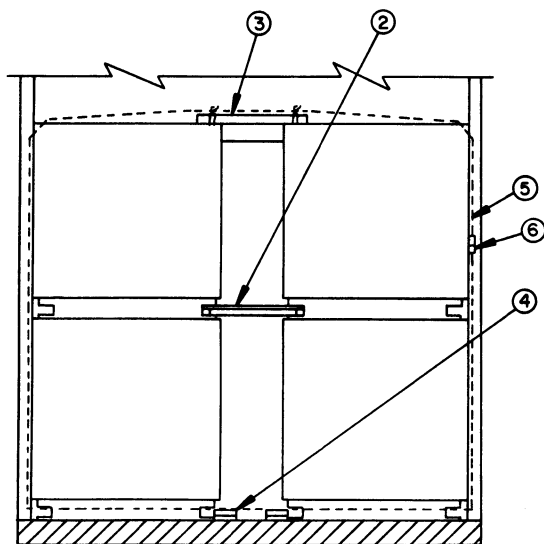
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	56-----	95,032 LBS
DUNNAGE-----	-----	1,601 LBS
TOTAL WEIGHT-----		96,633 LBS (APPROX)



ISOMETRIC VIEW

KEY NUMBERS

- ① SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (4 REQD). POSITION AGAINST THE LOAD DIVIDER BULKHEAD. SEE THE "STOP PIECE LOCATION DETAIL" ON PAGE 26, AND SPECIAL NOTES 3 AND 4 ON PAGE 25.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE SPECIAL NOTES 5 AND 6 ON PAGE 25.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17.
- ④ FLOORLINE BLOCKING, 2" X 6" X 36" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTES 5 AND 6 ON PAGE 25.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 33'-6" LONG STEEL STRAPPING (4 REQD). THREAD THRU HOLES ON TOP DUNNAGE ASSEMBLY, STAPLE TO PIECE MARKED ③ W/2 STAPLES.
- ⑥ SEAL FOR 1-1/4" STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑦ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 26.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT (REF: 38") (16 REQD). TOENAIL TO PIECES MARKED ⑦ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.



SECTION F-F

5-LAYER PALLET UNIT

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

(SPECIAL NOTES CONTINUED)

8. A "STRUT ASSEMBLY FOR 1-PIECE BULKHEAD", DETAIL SHOWN ON PAGE 85, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD THE STRUT ASSEMBLY WOULD NOT BE REQUIRED IF THE LOAD CONSISTED OF FOUR (4) LOAD UNITS IN EACH END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 50' OR LONGER CARS, PROVIDING THERE ARE NO PALLET UNITS OR DUNNAGE BETWEEN THE LOAD DIVIDERS, AS SHOWN.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS BY OMITTING THE TOP UNITS FROM THE CENTER PORTION OF THE LOAD, OR BY OMITTING TWO (2) ENTIRE LOAD UNITS. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF SIX (6) 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 BEHIND THE BULKHEADS. ALSO, A 2-TIER LOAD CAN BE REDUCED BY TEN (10) UNITS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 44, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 48 THRU 57 AND GENERAL NOTE "GG" 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 71 AND/OR PAGES 72 AND 74 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED, CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 24 IS THE 5-LAYER UNIT. A MAXIMUM OF EIGHTY-FOUR (84) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 142,548 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF FIFTY-FOUR (54) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 91,638 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE LENGTHWISE LOADING PATTERN SHOWN ON PAGE 12 IS EMPLOYED, THEN SEVENTY-SIX (76) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 128,972 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, SIXTY (60) UNITS CAN BE LOADED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 101,820 POUNDS, AND FORTY-EIGHT (48) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 81,456 POUNDS.
3. SEPARATOR GATES SHOWN AS PIECES MARKED ①, WHICH ARE POSITIONED IN THE CAR PRIOR TO POSITIONING THE PALLET UNITS, MUST BE PREVENTED FROM LATERAL DISPLACEMENT BY APPLICATION OF A STOP PIECE. STOP PIECES ARE REQUIRED ON FOUR (4) GATES IN THE LOAD ON PAGE 24.
4. SEPARATOR GATES SHOWN AS PIECES MARKED ① MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED; OR THEY MAY BE FORMED FROM DIMENSIONAL LUMBER AS SHOWN BY THE "ALTERNATIVE SEPARATOR GATE DETAIL ON PAGE 76.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ④ IN THE LOAD ON PAGE 18, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND AVAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED; OMIT THE LOWER ANTI-SWAY BRACES IN THE DOORWAY.
6. FLOORLINE BLOCKING SHOWN AS PIECE MARKED ④ IN THE LOAD VIEW, IS REQUIRED FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS. 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 THE SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.
7. IF THE CAR TO BE LOADED IS MORE THAN 9'-2" WIDE, THE HIGH "CRIB FILL C" DETAILED ON PAGE 27, MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD IN 40' AND 50' CARS. FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR; USE "CRIB FILL D" DETAILED ON PAGE 27 FOR THE BALANCE OF THE LOAD. SEE KEY NUMBERS ① AND ② ON PAGE 36 AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR INSTALLATION GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	7	3
2" X 2"	110	37
2" X 3"	14	7
2" X 4"	25	17
2" X 6"	210	210
4" X 4"	56	75
NAILS	NO. REQD	POUNDS
6d (2")	40	1/4
10d (3")	316	5
12d (3-1/4")	12	1/4
16d (3-1/2")	96	2
PLYWOOD, 3/8" (4 SHEETS)----- 128 SQ FT REQD-----132 LBS		
STEEL STRAPPING, 1-1/4"----- 134' REQD----- 20 LBS		
SEAL FOR 1-1/4" STRAPPING----- 8 REQD----- NIL		
STAPLE FOR 1-1/4" STRAPPING----- 8 REQD----- NIL		

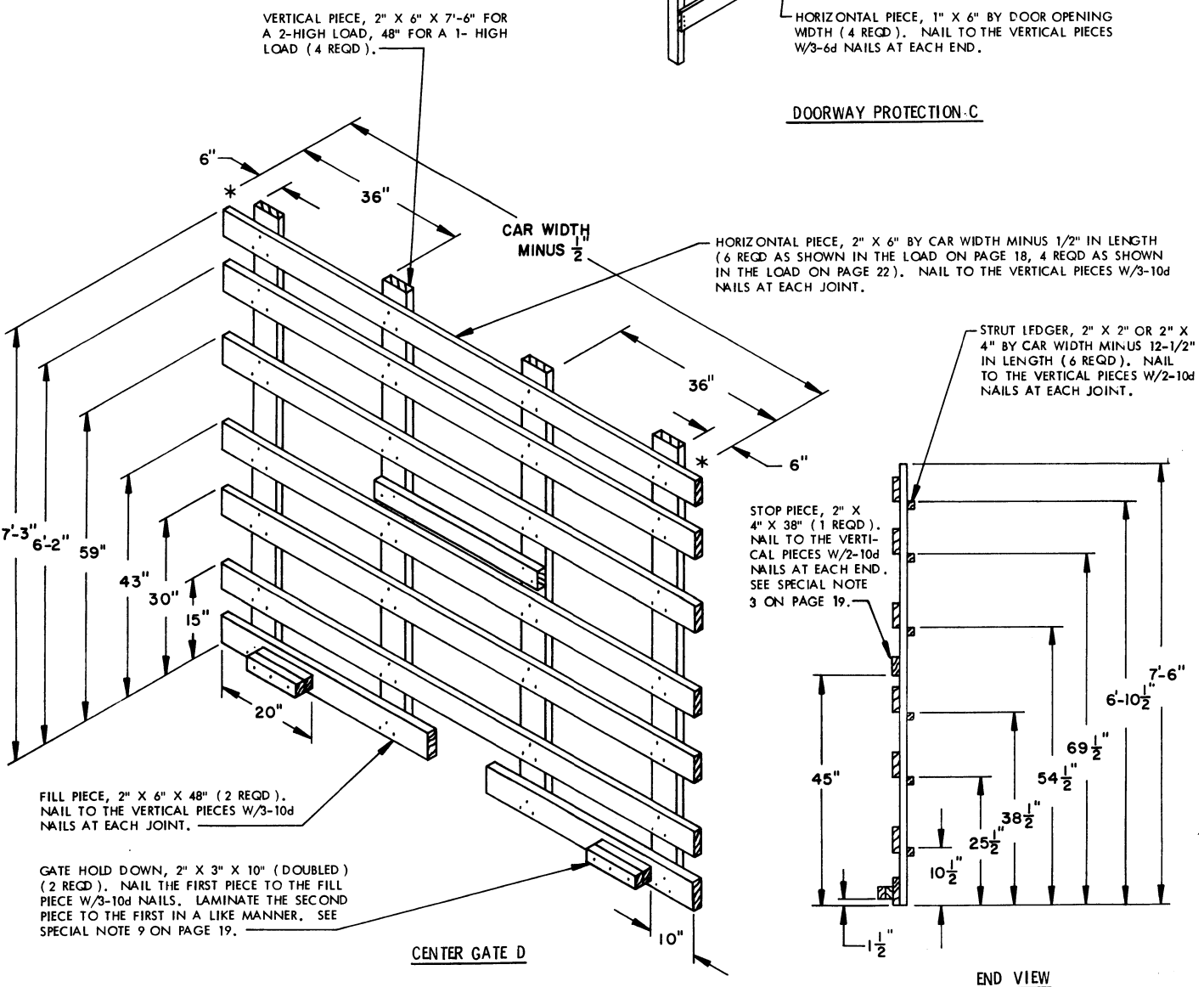
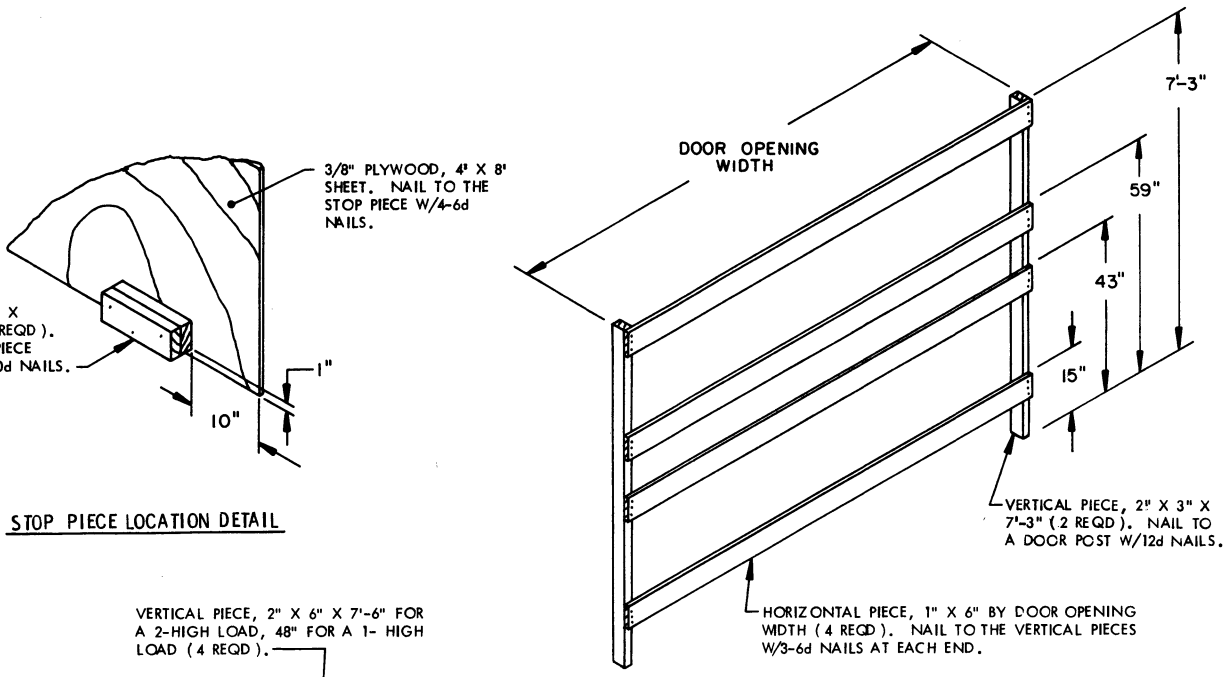
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ITEM QUANTITY WEIGHT (APPROX)

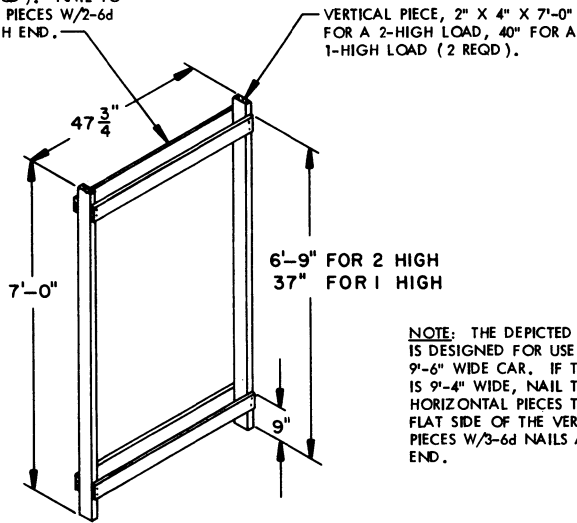
PALLET UNIT----- 68----- 115,396 LBS
DUNNAGE----- 856 LBS

TOTAL WEIGHT----- 116,252 LBS (APPROX)

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



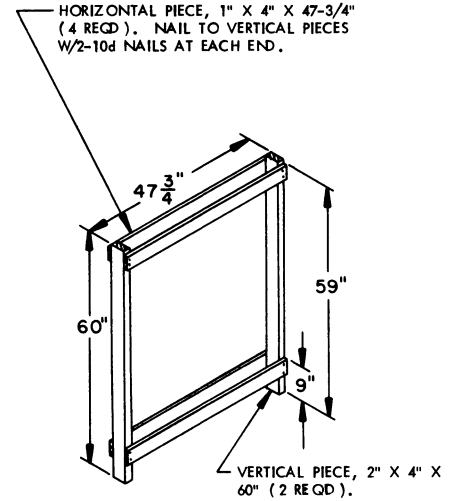
HORIZONTAL PIECE, 1" X 4" X 47-3/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH END.



CRIB FILL C

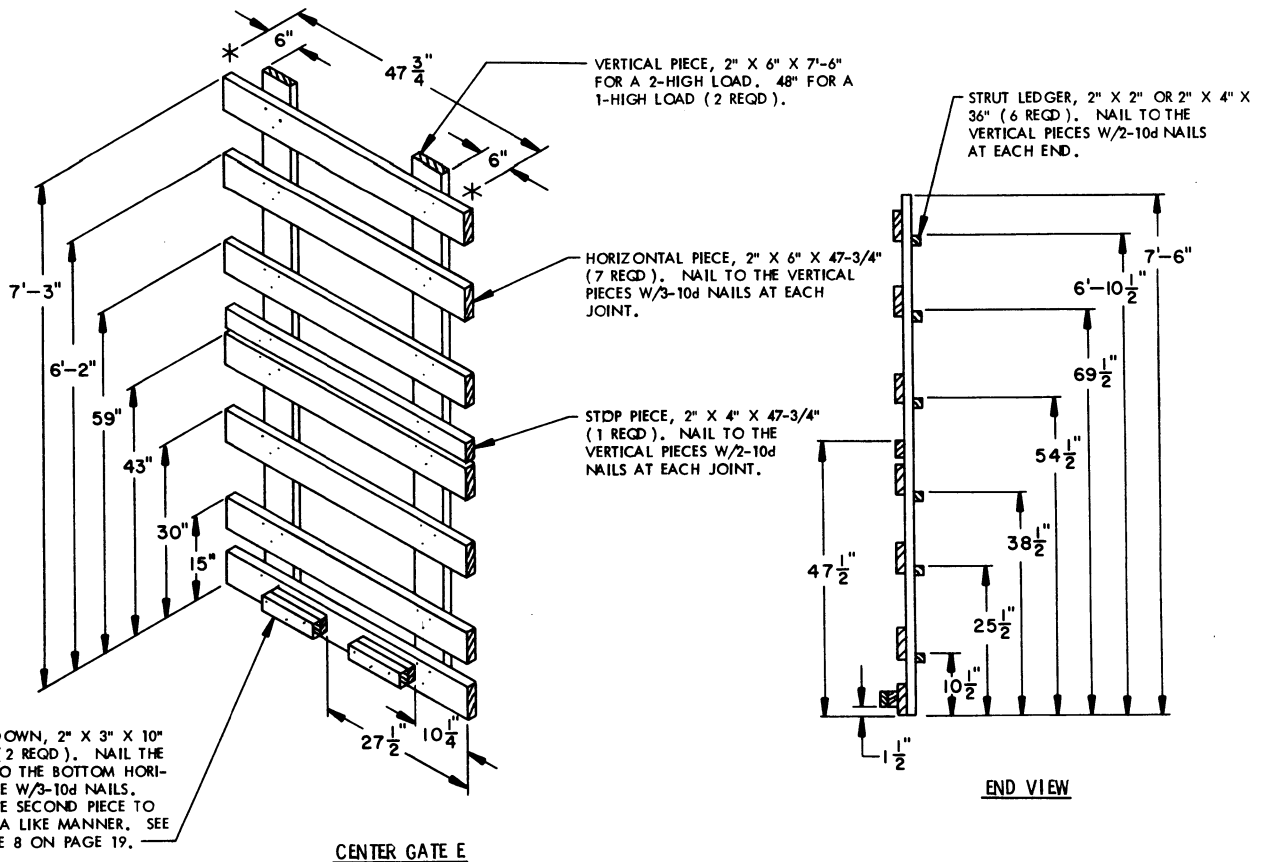
CRIB FILL ASSEMBLIES "C" AND "D" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 1" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS.

HORIZONTAL PIECE, 1" X 4" X 47-3/4" (4 REQD). NAIL TO VERTICAL PIECES W/2-10d NAILS AT EACH END.



CRIB FILL D

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



CENTER GATE E

END VIEW

DETAILS FOR 5-LAYER PALLET UNIT

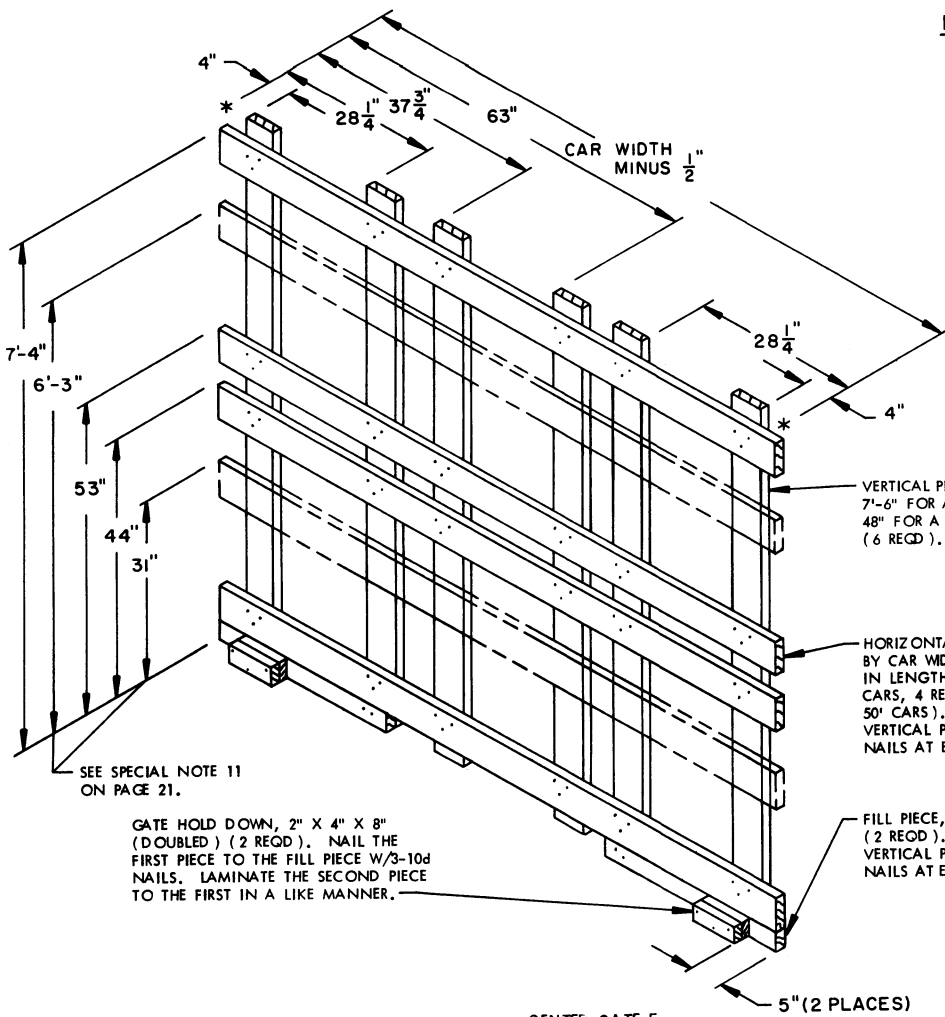
VERTICAL PIECE, 2" X 3" X 7'-4" FOR A 2-HIGH LOAD, 44" FOR A 1-HIGH LOAD (2 REQD). NAIL TO A DOOR POST W/12d NAILS.

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

44" FOR A ONE HIGH LOAD

DOOR OPENING WIDTH

DOORWAY PROTECTION D



STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 9" IN LENGTH (6 REQD IN 60' CARS, 4 REQD IN 40' AND 50' CARS). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

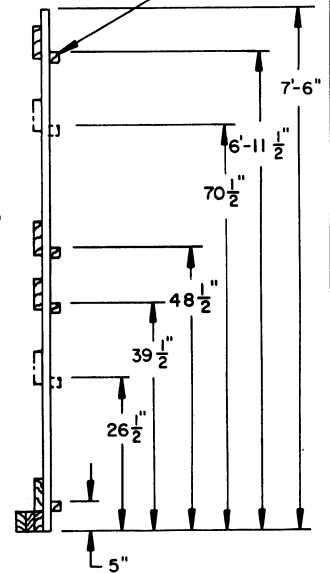
VERTICAL PIECE, 2" X 6" X 7'-6" FOR A 2-HIGH LOAD, 48" FOR A 1-HIGH LOAD (6 REQD).

HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH MINUS 1/2" IN LENGTH (6 REQD IN 60' CARS, 4 REQD IN 40' AND 50' CARS). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

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

SEE SPECIAL NOTE 11 ON PAGE 21.

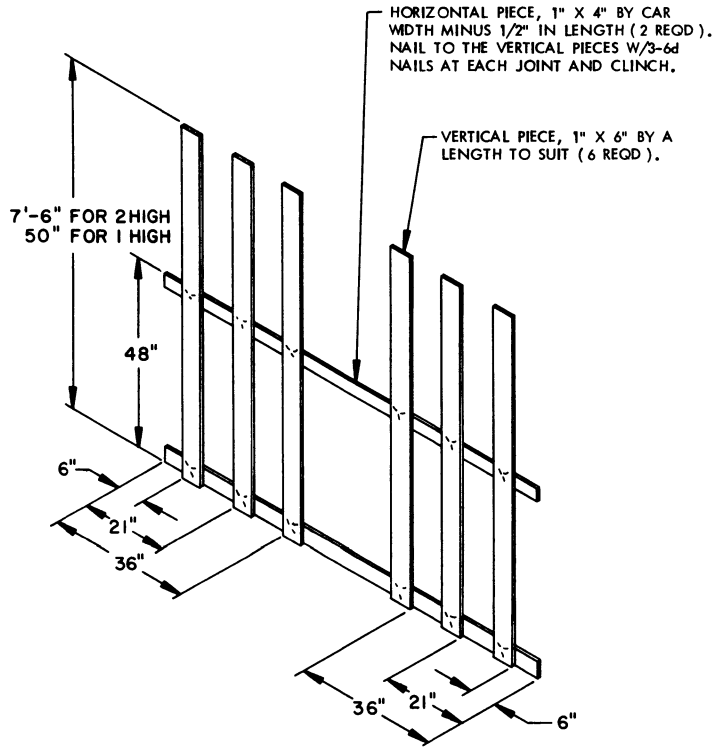
GATE HOLD DOWN, 2" X 4" X 8" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FILL PIECE W/3-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.



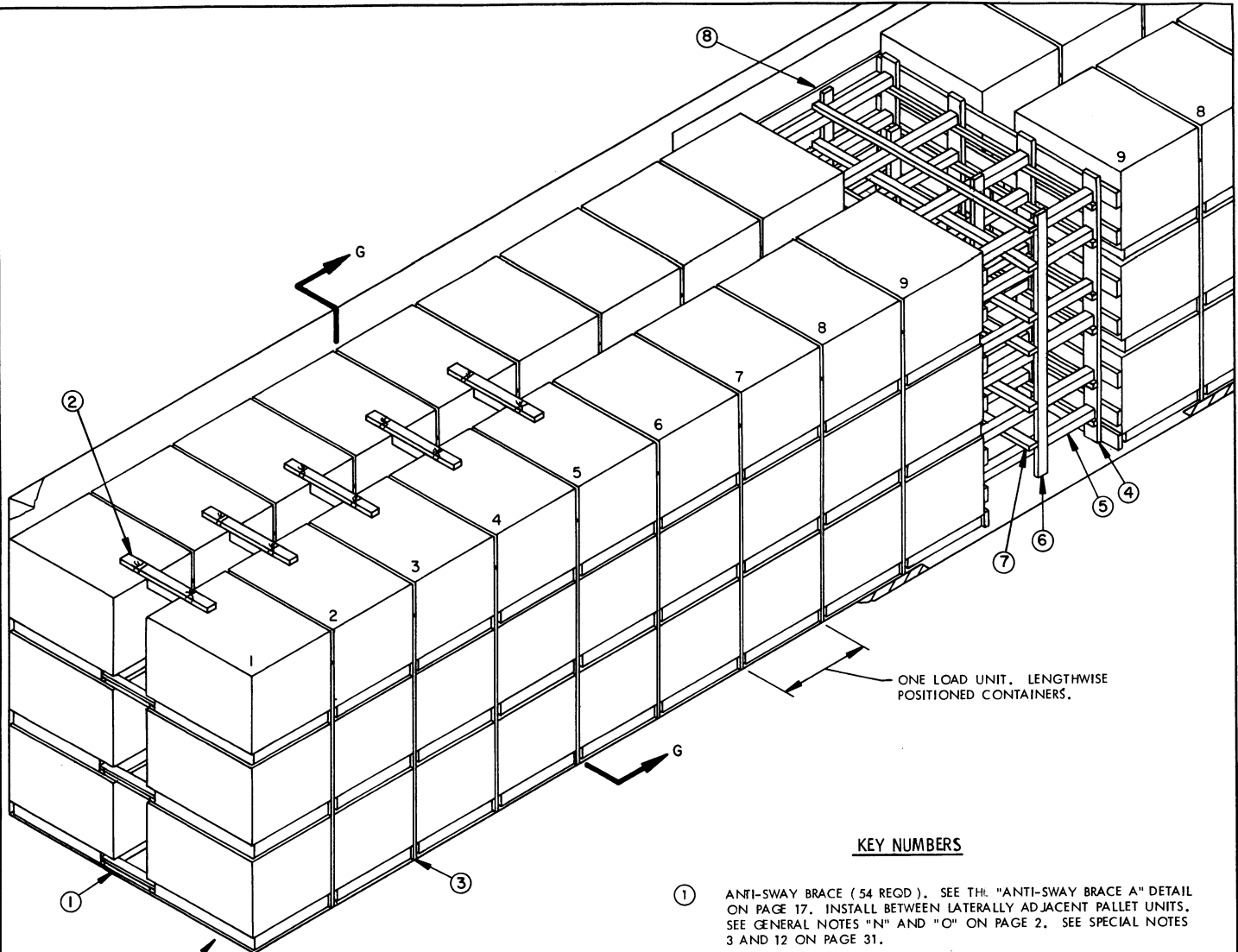
CENTER GATE F

(1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED)

END VIEW

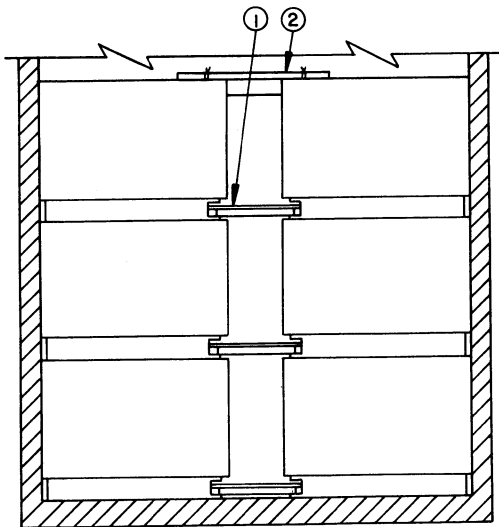


SEPARATOR GATE B



SEE GENERAL NOTE "H" ON PAGE 2.

ISOMETRIC VIEW



SECTION G-G

KEY NUMBERS

- ① ANTI-SWAY BRACE (54 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTES 3 AND 12 ON PAGE 31.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 31.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' AND 8' SHEET (32 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE TWO UPPER ANTI-SWAY BRACES MARKED ① W/1-6d NAIL EACH. SEE SPECIAL NOTES 5 AND 6 ON PAGE 31.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 38. SEE SPECIAL NOTES 7, 8, AND 9 ON PAGE 31.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 68") (24 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" X 8'-9" (4 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 10" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑧ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION E" DETAIL ON PAGE 38. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 11 AND 12 ON PAGE 31.

4-LAYER PALLET UNIT

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

(SPECIAL NOTES CONTINUED)

11. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED (6) IN THE LOAD ON PAGE 30 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.
12. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED, OMIT EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA; IN LIEU OF PIECES MARKED (8), USE PIECES MARKED (3) THRU (6) ON PAGE 24. SEE SPECIAL NOTES 6 AND 7 ON PAGE 25 FOR GUIDANCE. TO PREVENT DAMAGE FROM LONGITUDINAL MOVEMENT DURING TRANSIT, A 4" X 4" NOTCH MUST BE CUT FROM THE CORNER OF SEPARATOR GATES WHICH ARE ADJACENT TO THE FLOORLINE BLOCKING, PIECE MARKED (4) ON PAGE 24.
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 SIX (6) PALLET UNITS, OR A 2-TIER 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 47 THRU 70 FOR GUIDANCE.
14. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 72 FOR SHIPPING GUIDANCE.
15. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE..

SPECIAL NOTES:

1. A 60' LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 10 BELOW.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 30 IS THE 4-LAYER UNIT. A MAXIMUM OF NINETY (90) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 124,470 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; SEVENTY-TWO (72) UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 99,576 POUNDS, CAN BE OUTLOADED IN A 40'-6" LONG CAR. SEE SPECIAL NOTE 10 BELOW.
3. ANTI-SWAY BRACING IS REQUIRED BETWEEN LATERALLY ADJACENT PALLET UNITS, TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACE BETWEEN THE UPPER UNITS, A STOP PIECE MUST BE NAILED TO EACH CENTER GATE "G" AS SHOWN ON THE DETAIL ON PAGE 38.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 30, MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' CARS.
5. SEPARATOR GATES SHOWN AS PIECES MARKED (3) MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED; ALSO, THEY MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
6. SEPARATOR GATES MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. SEE THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
7. CENTER GATE "G" 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 A" DETAIL ON PAGE 77 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 G" SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 30, CONSTRUCT TWO (2) CENTER GATES "H" AS SHOWN ON PAGE 39. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION A" DETAIL ON PAGE 79.
9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE G, PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
10. NOTE THAT AN ADDITIONAL SIX (6) PALLET UNITS CAN BE POSITIONED IN THE LOAD ON PAGE 30. THEN, SIX STRUTS WILL BE REQUIRED PER ROW/TIER. TWO ADDITIONAL VERTICAL PIECES WILL BE REQUIRED AS SHOWN BY THE DOTTED LINES ON THE "CENTER GATE G" DETAIL ON PAGE 38, AND PIECES MARKED (4) AND (7) WILL NOT BE REQUIRED.

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BILL OF MATERIAL

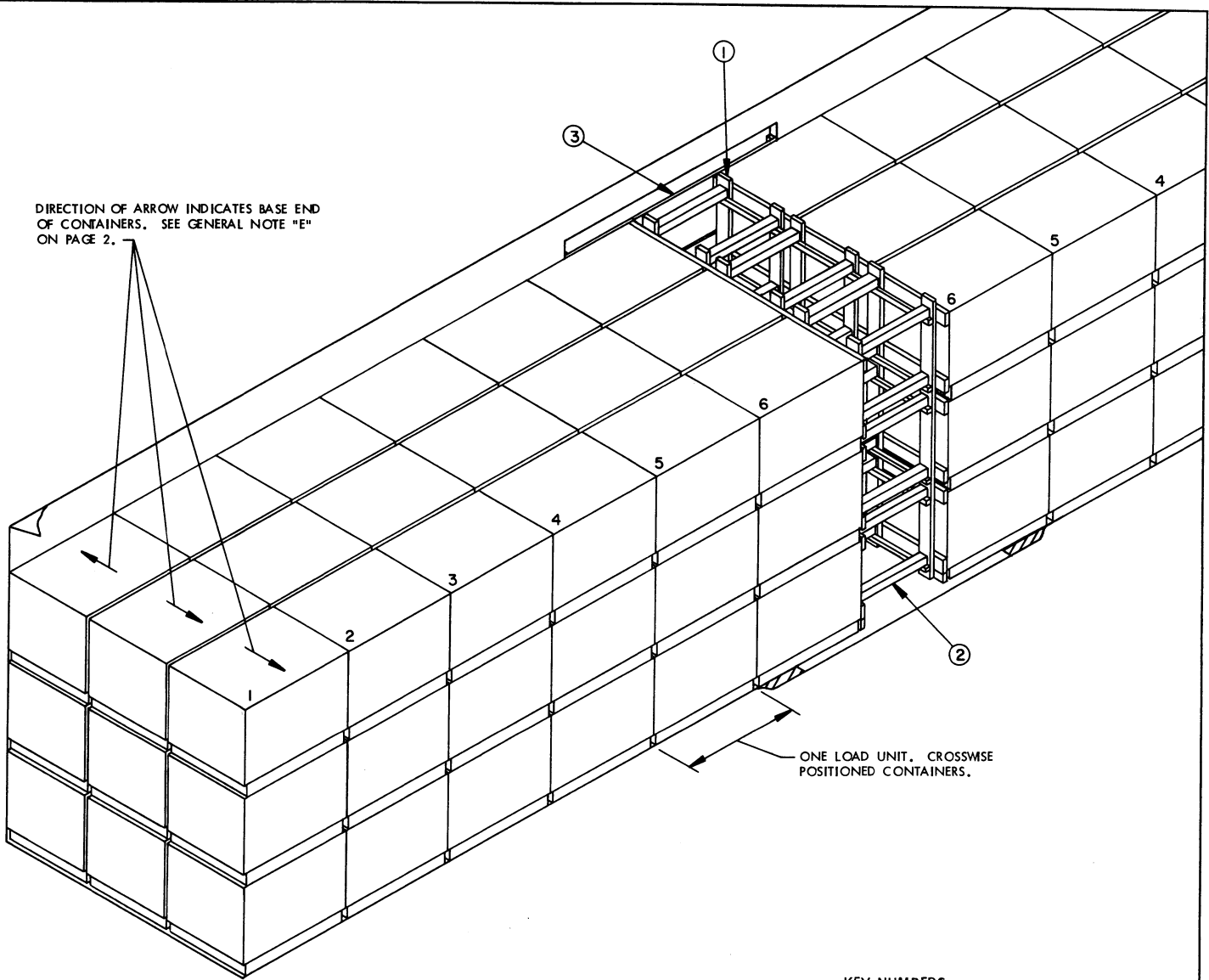
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	207	69
1" X 6"	120	60
2" X 2"	422	141
2" X 3"	41	21
2" X 4"	305	204
2" X 6"	197	197
4" X 4"	148	198
NAILS	NO. REQD	POUNDS
6d (2")	784	5
10d (3")	664	10
12d (3-1/4")	62	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ----- 100' REQD ----- 2 LBS		
PLYWOOD, 3/8" (32 SHEETS) ----- 1,024 SQ FT REQD ----- 1,056 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	108	149,364 LBS
DUNNAGE		2,857 LBS
TOTAL WEIGHT		152,221 LBS (APPROX)

4-LAYER PALLET UNIT
108-UNIT LOAD IN A 60'-8" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

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



ISOMETRIC VIEW

KEY NUMBERS

- ① CENTER GATE (2 REQD, ONE RIGHT HAND AND ONE LEFT HAND). SEE THE "CENTER GATE J" DETAIL ON PAGE 40. SEE SPECIAL NOTES 4, 5, 6, AND 9 ON PAGE 33.
- ② STRUT, 4" X 4" BY CUT TO FIT (REF: 27") (36 REQD). TOENAIL TO PIECES MARKED ① W/2-6d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ③ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 40. NAIL TO THE DOOR POSTS W/12 NAILS. SEE SPECIAL NOTES 7 AND 8 ON PAGE 33.

(SPECIAL NOTES CONTINUED)

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 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 CENTER PORTION OF THE LOAD. ALSO A 2 OR 3-TIER LOAD CAN BE REDUCED BY TWELVE (12) UNITS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 44; 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 46 THRU 69 FOR GUIDANCE.
11. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGES 71 AND 74 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. WIDER CARS OF OTHER LENGTHS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 32 IS THE 4-LAYER UNIT. A MAXIMUM OF EIGHTY-ONE (81) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 112,023 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. ONE HUNDRED TWENTY-SIX (126) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 174,258 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR.
3. IF THE CAR TO BE LOADED IS MORE THAN 9'-2" WIDE, THE HIGH "CRIB FILL E" DETAILED ON PAGE 39 MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF THE LOAD IN 40' AND 50' CARS. FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR; USE "CRIB FILL F" DETAILED ON PAGE 39 FOR THE BALANCE OF THE LOAD. IF DESIRED, IN CARS HAVING NAILABLE SIDEWALLS, 1" X 6" OR 2" X 6" FILL MATERIAL MAY BE NAILED TO ONE OR BOTH SIDEWALLS AT HEIGHTS SPECIFIED FOR THE DOORWAY PROTECTION IN LIEU OF THE SPECIFIED CRIB FILL. NOTE THAT THE TOTAL ACCUMULATED SPACE ACROSS A CAR SHOULD NOT EXCEED THREE INCHES (3").
4. CENTER GATE "J" 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 B" DETAIL ON PAGE 77 FOR GUIDANCE.
5. 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 J", SHOWN AS PIECE MARKED (1) IN THE LOAD ON PAGE 32, INSTALL TWO (2) "CENTER GATES K" AND TWO (2) "CENTER GATES L" AS SHOWN ON PAGE 78. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TIE PIECE APPLICATION B" DETAIL ON PAGE 79.
6. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" HOLD DOWNS ON CENTER GATES "J", PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 81 FOR GUIDANCE.
7. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION SHOWN AS PIECES MARKED (3) IN THE LOAD ON PAGE 32 IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS; OR NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MAY BE USED. REFER TO PAGES 82 THRU 84 FOR OTHER TYPES OF DOORWAY PROTECTION. NOTE: IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED.
8. IF THE FLOORLINE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED IN LIEU OF THE WOODEN GATE TYPE MARKED (3), REFER TO KEY NUMBERS (3) THRU (6) ON PAGE 36, AND SPECIAL NOTES 5 AND 6 ON PAGE 37 FOR GUIDANCE.
9. IF SPECIAL NOTE 8 APPLIES, THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" PIECE POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE TWO CENTER VERTICAL PIECES OF A CENTER GATE. TWO (2) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	96	48
2" X 2"	102	34
2" X 3"	42	21
2" X 4"	12	8
2" X 6"	223	223
4" X 4"	81	108
NAILS	NO. REQD	POUNDS
6d (2")	77	1/2
10d (3")	608	9-1/2
12d (3-1/4")	32	1/2
16d (3-1/2")	144	3-1/4

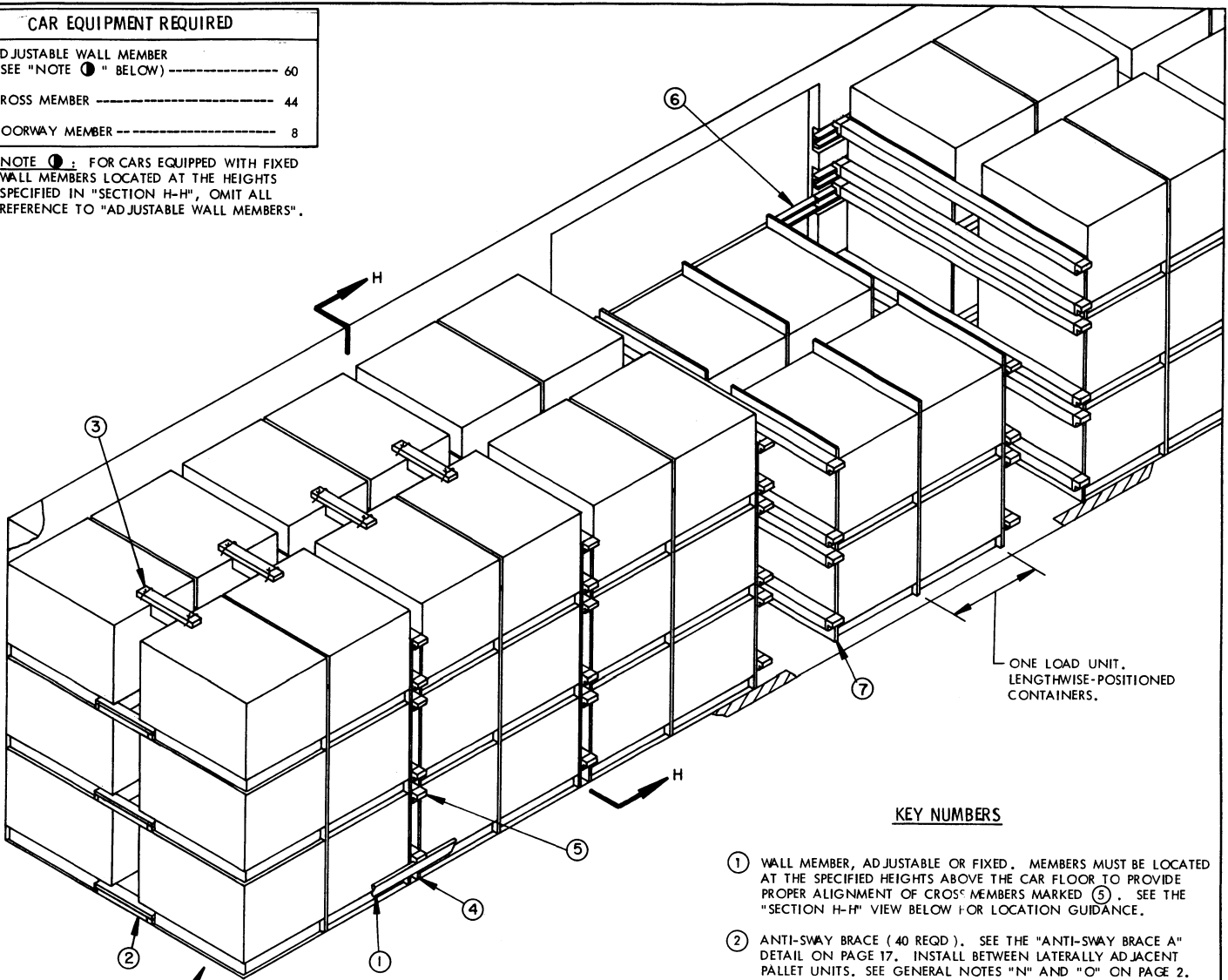
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	108	149,364 LBS
DUNNAGE-----		898 LBS
TOTAL WEIGHT-----		150,262 LBS (APPROX)

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER (SEE "NOTE 1" BELOW)	60
CROSS MEMBER	44
DOORWAY MEMBER	8

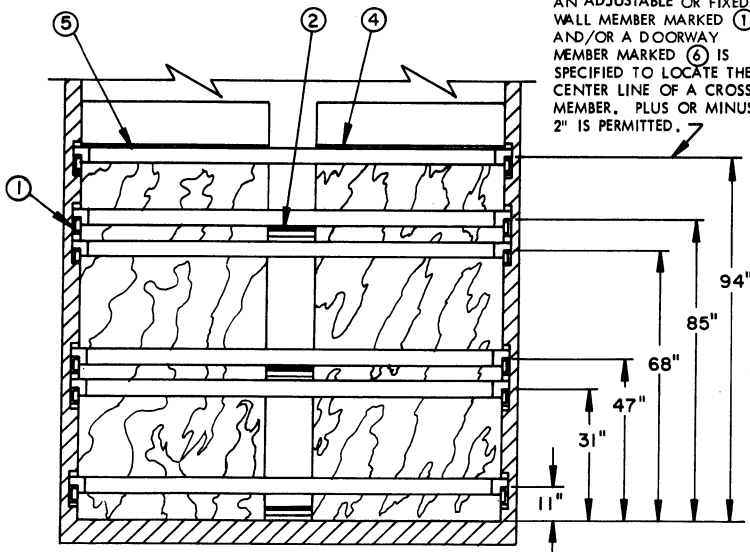
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION H-H", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBERS".



SEE GENERAL NOTES "D" AND "H" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 35.

ISOMETRIC VIEW

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. PLUS OR MINUS 2" IS PERMITTED.



SECTION H-H

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 H-H" VIEW BELOW FOR LOCATION GUIDANCE.
- ② ANTI-SWAY BRACE (40 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 ON PAGE 35.
- ④ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (32 REQD). POSITION AGAINST UNIT. NAIL TO THE ADJACENT CROSS BRACE OF THE TWO UPPER ANTI-SWAY BRACES MARKED ② W/1-6d NAIL EACH. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 35.
- ⑤ CROSS MEMBER (44 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑥ DOORWAY MEMBER (8 REQD). SEE THE "SECTION H-H" VIEW AT LEFT FOR GUIDANCE. SEE SPECIAL NOTE 8 ON PAGE 35.
- ⑦ SEPARATOR GATE, 3/8" PLYWOOD, 48" WIDE BY 6'-2" HIGH (6 REQD). NAIL TO THE ANTI-SWAY BRACES MARKED ② W/1-6d NAIL EACH.

4-LAYER PALLET UNIT

80-UNIT LOAD IN A 50'-6" LONG BY 9'-2" 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 HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE PALLETIZED UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 34 IS THE 4-LAYER UNIT. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 99,576 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR. SEE SPECIAL NOTE 8 BELOW.
3. IF A CAR HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, CROSS MEMBERS CAN BE INSTALLED NEAR THE END WALL OF THE CAR TO PROVIDE A "SQUARED END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "H" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS. A SEPARATOR GATE, CONSTRUCTED THE SAME AS THE "END WALL LINING" DETAILED ON PAGE 75 MUST BE POSITIONED AGAINST THESE CROSS MEMBERS PRIOR TO LOADING.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (3) IN THE LOAD ON PAGE 34, MUST BE INSTALLED IN EACH END OF THE CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. IF DESIRED, SEPARATOR GATES SHOWN AS PIECES MARKED (4) AND (7) MAY BE POSITIONED AN INCH OR TWO FROM THE CAR SIDEWALL, TO PROVIDE A LARGER BEARING SURFACE FOR THE SPECIFIED NAILING OF GATES.
6. SEPARATOR GATES MAY BE FORMED FROM 1/2" OR THICKER PLYWOOD IN LIEU OF 3/8", IF DESIRED.
7. SEPARATOR GATES, SHOWN AS PIECES MARKED (4) AND (7) MAY BE FORMED FROM DIMENSIONAL LUMBER IN LIEU OF PLYWOOD, IF DESIRED. FOR SEPARATOR GATES WHICH ARE ADJACENT TO THE CROSS MEMBERS REFER TO THE "SEPARATOR GATE C" DETAIL ON PAGE 41. FOR SEPARATOR GATES WHICH ARE NOT ADJACENT TO THE CROSS MEMBERS, REFER TO THE "ALTERNATIVE SEPARATOR GATE" DETAIL ON PAGE 76.
8. NOTE THAT TEN (10) ADDITIONAL PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 124,470 POUNDS CAN BE POSITIONED IN THE DOORWAY AREA OF THE CAR, PROVIDING THAT THE CAR BEING LOADED IS EQUIPPED WITH AT LEAST TWELVE (12) DOORWAY MEMBERS, AND THAT THE WEIGHT CAPACITY FOR THE CAR IS NOT EXCEEDED.
9. 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 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 PROCEDURES ON PAGES 42 AND 43 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

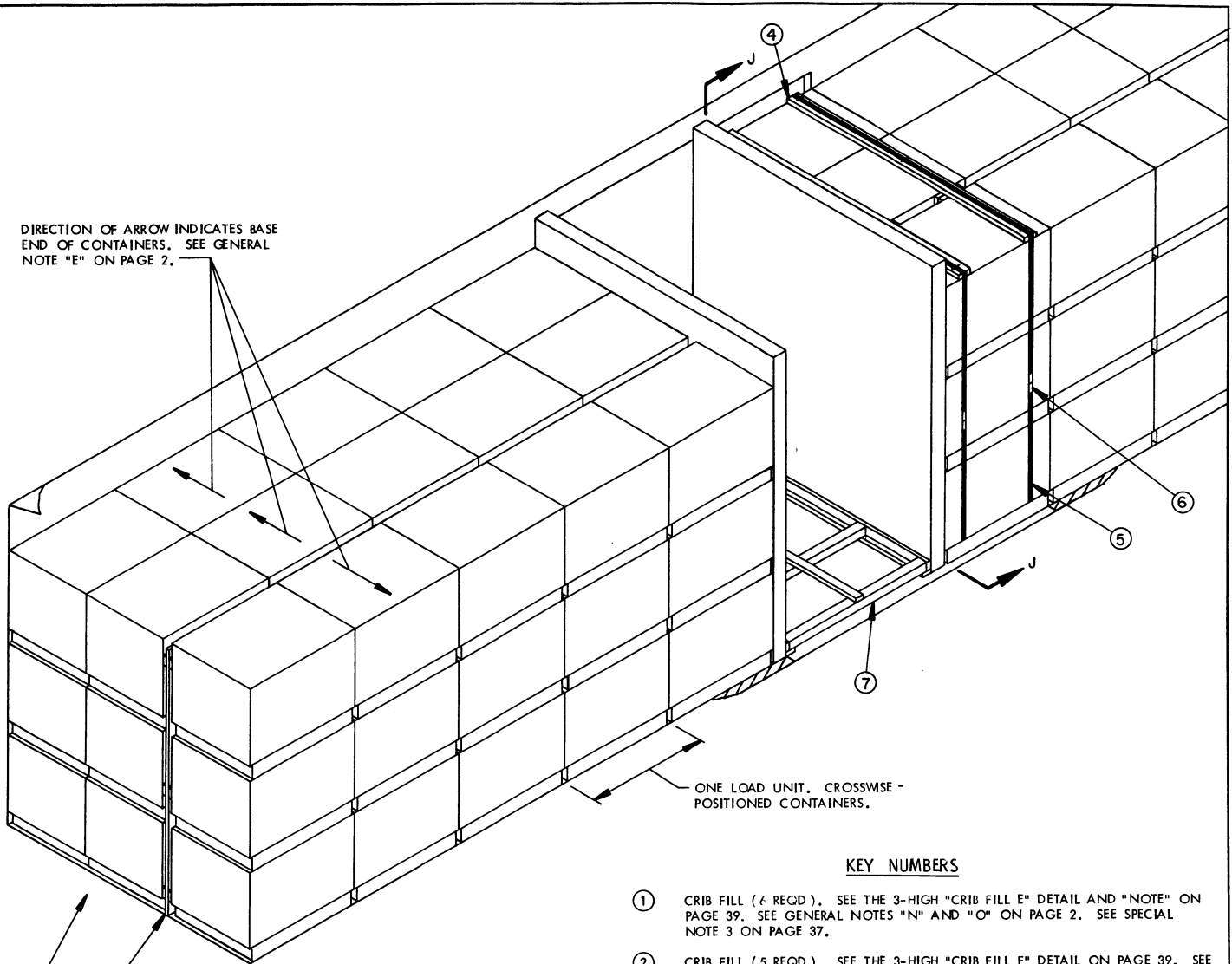
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	142	48
2" X 2"	240	80
2" X 4"	146	98
4" X 4"	9	12
NAILS	NO. REQD	POUNDS
6d (2")	556	3-1/2
10d (3")	160	2-1/2
12d (3-1/4")	24	1/2
PLYWOOD, 3/8" (38 SHEETS) -----1,172 SQ FT REQD--- 1,209 LBS		
WIRE, NO. 14 GAGE ----- 80 REQD----- 1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	80-----	110,640 LBS
DUNNAGE-----	-----	1,694 LBS
TOTAL WEIGHT-----		112,333 LBS (APPROX)

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

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



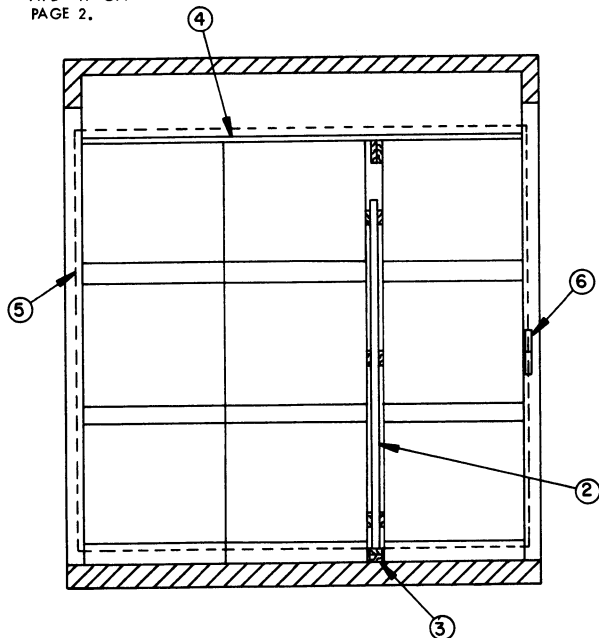
ONE LOAD UNIT. CROSSWISE - POSITIONED CONTAINERS.

KEY NUMBERS

- ① CRIB FILL (4 REQD). SEE THE 3-HIGH "CRIB FILL E" DETAIL AND "NOTE" ON PAGE 39. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 3 ON PAGE 37.
- ② CRIB FILL (5 REQD). SEE THE 3-HIGH "CRIB FILL F" DETAIL ON PAGE 39. SEE SPECIAL NOTE 5 ON PAGE 37.
- ③ FLOORLINE BLOCKING, 2" X 4" X 48" (DOUBLED) (1 REQD). PRE-POSITION 3/4" FROM THE NEAR SIDE CAR WALL. 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 NOTES 4 AND 5 ON PAGE 37.
- ④ STRAPPING BOARD ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 41.
- ⑤ BUNDLING STRAP, 1-1/4" X .031" OR .035" X 38-6" LONG STEEL STRAPPING (2 REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 37.
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑦ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 85. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 37.

ISOMETRIC VIEW

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



SECTION J-J

4-LAYER PALLET UNIT

99-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-4" WIDE WOOD-LINED CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "BB" THRU "FF" ON PAGE 3.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 36 IS THE 4-LAYER UNIT. A MAXIMUM OF ONE HUNDRED TWENTY-SIX (126) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 174,258 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF EIGHT-ONE (81) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 112,023 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF THE LENGTHWISE LOADING PATTERN SHOWN ON PAGE 30 IS EMPLOYED, ONE-HUNDRED-FOURTEEN (114) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 157,662 POUNDS CAN BE PLACED IN A 60'-8" LONG CAR, NINETY (90) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 124,470 POUNDS, AND SEVENTY-TWO (72) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 99,576 POUNDS.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ① MUST BE INSTALLED IN EACH END OF THE LOAD. THREE (3) ASSEMBLIES ARE REQUIRED IN EACH END OF A 60' CAR AND 50' CARS. FOUR (4) ARE REQUIRED IN EACH END OF A 60' CAR. IF THE CAR TO BE LOADED IS LESS THAN 9'-4" WIDE, OMIT PIECES MARKED ① AND ②.
4. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO IT BY ONE-HALF OR MORE OF THE STACK WIDTH. DOORWAY PROTECTION WILL CONSIST OF NAILED-DOWN BLOCKING BETWEEN THE STACKS, AND STEEL STRAPPING ENCIRCLING THE LOAD UNIT. IF THE CAR BEING LOADED IS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILED DOOR POSTS A WOODEN GATE TYPE OF DOORWAY PROTECTION SUCH AS SHOWN IN THE LOAD ON PAGE 32 MAY BE USED.
5. FLOORLINE BLOCKING SHOWN AS PIECE MARKED ③ IN THE LOAD VIEW, IS REQUIRED FOR ALL UNITS REQUIRING DOORWAY PROTECTION STRAPS. IF THERE IS NOT ENOUGH ROOM FOR DIMENSIONAL LUMBER, FLOORLINE BLOCKING MUST BE RIPPED TO FIT. NOTE THAT THE CRIB FILL SHOWN AS PIECES MARKED ② MUST HAVE THREE INCHES (3") CUT OFF THE BOTTOM OF EACH VERTICAL PIECE THAT RESTS ON THE FLOORLINE BLOCKING.
6. 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 THE SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) DOORWAY PROTECTION STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.
7. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 36, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED LOAD THE STRUT ASSEMBLY WOULD NOT BE REQUIRED IF THE LOAD CONSISTED OF FOUR (4) LOAD UNITS IN EACH END OF THE CAR. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS REGARDLESS OF THE CAR LENGTH.
8. 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 CENTER PORTION OF THE LOAD. ALSO, A 2 OR 3-TIER LOAD CAN BE REDUCED BY ELEVEN (11) UNITS BY OMITTING THE CENTER ROW OF THE TOP TIER AS SHOWN ON PAGE 44, 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 48 THRU 57 AND GENERAL NOTE "GG" ON PAGE 3 FOR GUIDANCE.
9. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 71 AND/OR PAGES 72 AND 74 FOR SHIPPING GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 73 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	263	88
1" X 8"	17	12
2" X 4"	235	157
2" X 6"	22	22
4" X 4"	22	30
NAILS	NO. REQD	POUNDS
6d (2")	280	1-3/4
10d (3")	34	1/2
12d (3-1/4")	24	1/2
16d (3-1/2")	10	1/4
STEEL STRAPPING, 1-1/4" ----- 77' REQD ----- 11 LBS		
SEAL FOR 1-1/4" STRAPPING ----- 4 REQD ----- NIL		
STAPLE FOR 1-1/4" STRAPPING ----- 6 REQD ----- NIL		

LOAD AS SHOWN

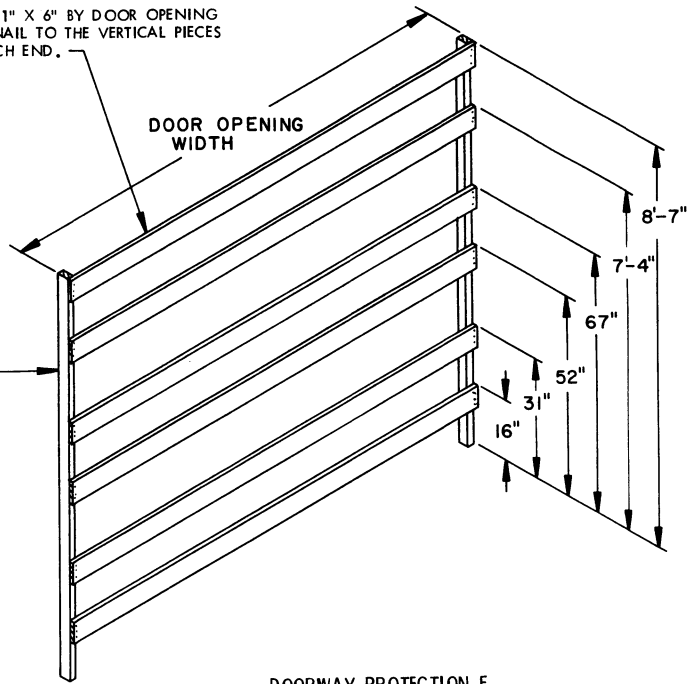
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	99	136,917 LBS
DUNNAGE		632 LBS
TOTAL WEIGHT		137,549 LBS (APPROX)

4-LAYER PALLET UNIT
 99-UNIT LOAD IN A 50'-6" LONG BY 9'-4" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

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

DOOR OPENING WIDTH

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



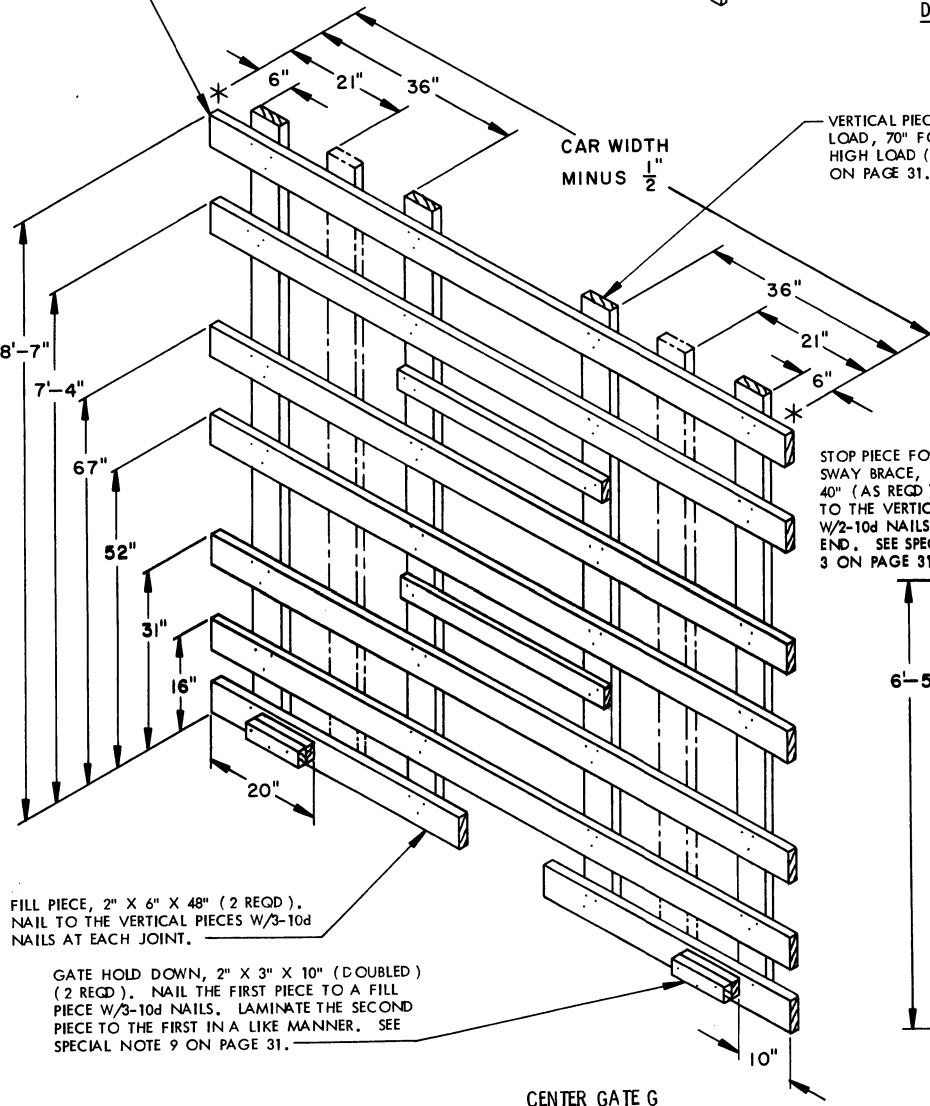
DOORWAY PROTECTION E

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

CAR WIDTH MINUS 1/2"

VERTICAL PIECE, 2" X 6" X 8'-10" FOR A 3-HIGH LOAD, 70" FOR A 2-HIGH LOAD, 34" FOR A 1-HIGH LOAD (6 REQ'D). SEE SPECIAL NOTE 10 ON PAGE 31.

STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 12-1/2" IN LENGTH (AS REQ'D). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

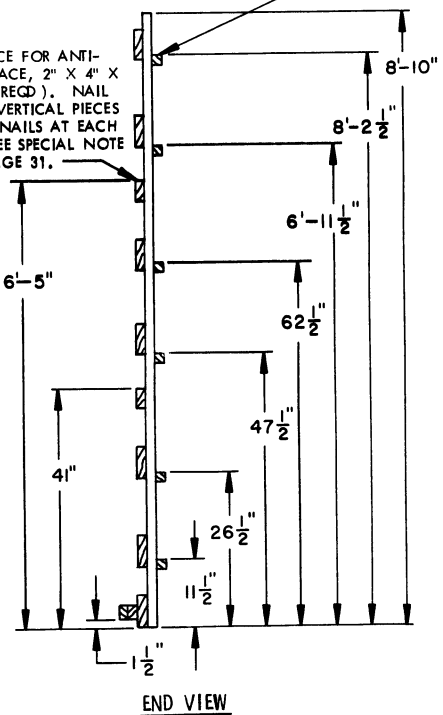


CENTER GATE G

FILL PIECE, 2" X 6" X 48" (2 REQ'D). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

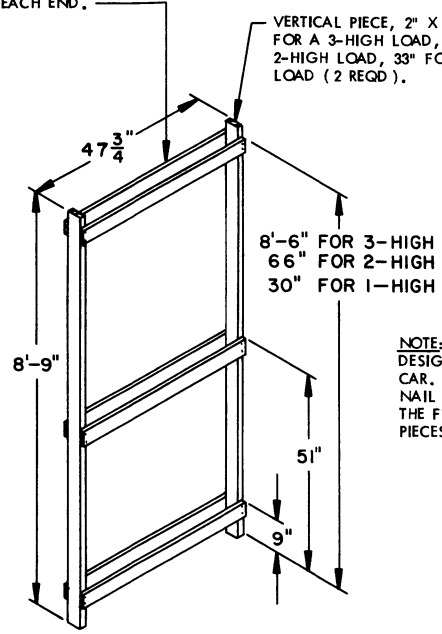
GATE HOLD DOWN, 2" X 3" X 10" (DOUBLED) (2 REQ'D). NAIL THE FIRST PIECE TO A FILL PIECE W/3-10d NAILS. LAMINATE THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 9 ON PAGE 31.

STOP PIECE FOR ANTI-SWAY BRACE, 2" X 4" X 40" (AS REQ'D). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END. SEE SPECIAL NOTE 3 ON PAGE 31.



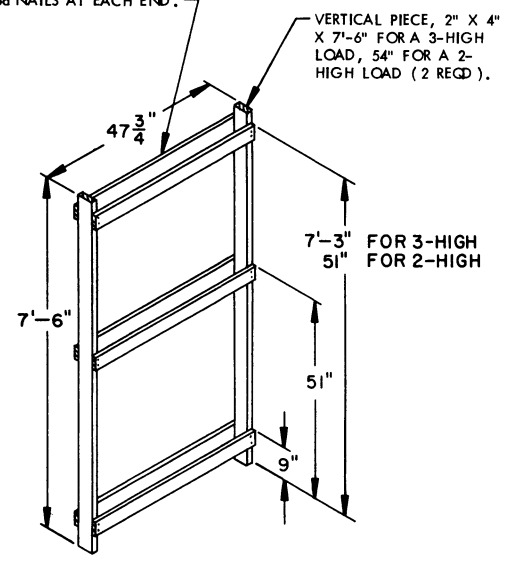
END VIEW

HORIZONTAL PIECE, 1" X 4" X 47-3/4" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH END.



VERTICAL PIECE, 2" X 4" X 8'-9" FOR A 3-HIGH LOAD, 69" FOR A 2-HIGH LOAD, 33" FOR A 1-HIGH LOAD (2 REQD).

HORIZONTAL PIECE, 1" X 4" X 47-3/4" (6 REQD). NAIL TO THE VERTICAL PIECES W/2-6d NAILS AT EACH END.



VERTICAL PIECE, 2" X 4" X 7'-6" FOR A 3-HIGH LOAD, 54" FOR A 2-HIGH LOAD (2 REQD).

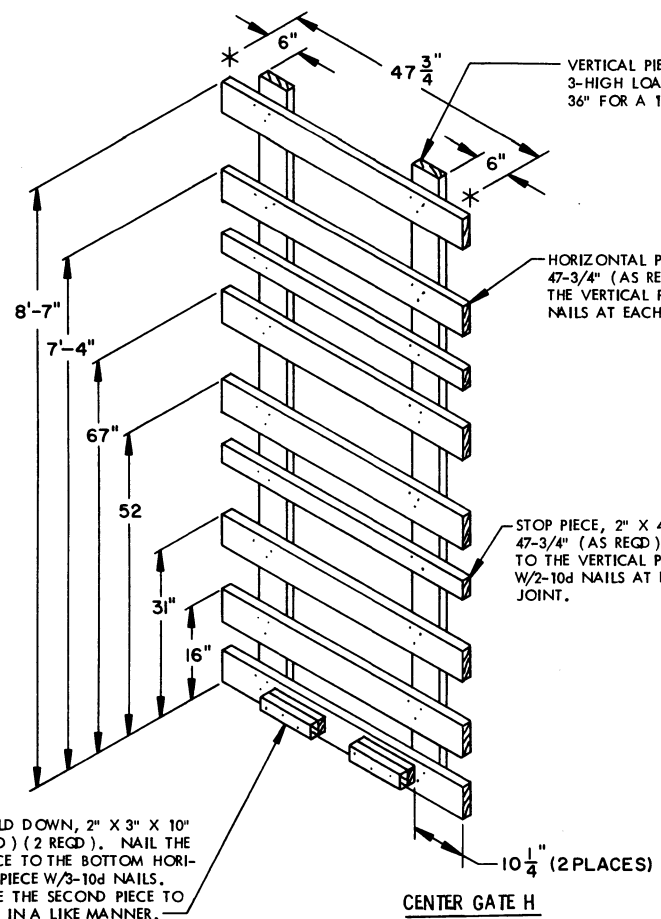
NOTE: THE DEPICTED CRIB FILL IS DESIGNED FOR USE IN A 9'-6" WIDE CAR. IF THE CAR IS 9'-4" WIDE, NAIL THE HORIZONTAL PIECES TO THE FLAT SIDE OF THE VERTICAL PIECES W/3-6d NAILS AT EACH END.

CRIB FILL E

CRIB FILL F

CRIB FILL ASSEMBLIES "E" AND "F" SHOULD BE PRE-FABRICATED. CONSTRUCT TO BE 1/2" TO 1" LESS IN WIDTH THAN THE DISTANCE BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. OMIT THE MID-HEIGHT HORIZONTAL PIECES WHEN USING CRIB FOR A 1 OR 2-HIGH LOAD.

OMIT THE MID-HEIGHT HORIZONTAL PIECES WHEN USING CRIB FOR A 2-HIGH LOAD. CRIB FILL "F" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "E" THROUGHOUT THE LENGTH OF THE LOAD.



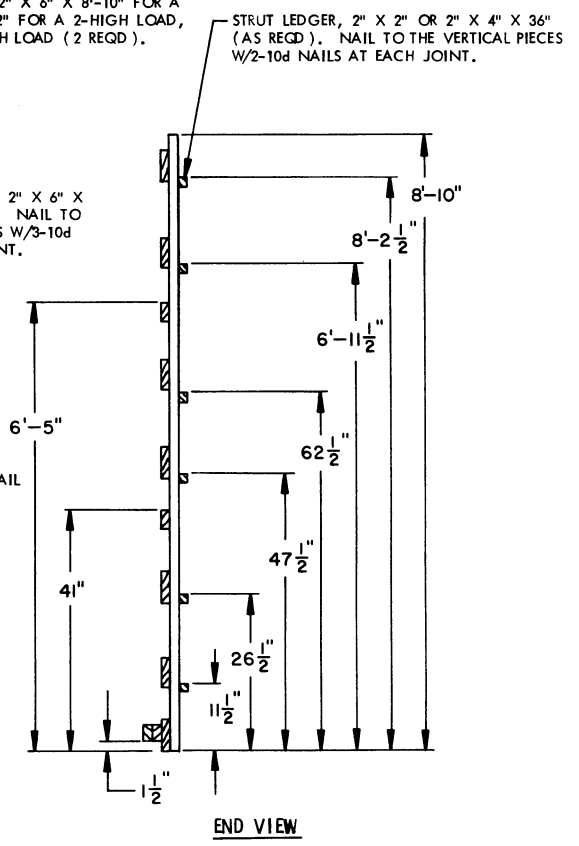
VERTICAL PIECE, 2" X 6" X 8'-10" FOR A 3-HIGH LOAD, 72" FOR A 2-HIGH LOAD, 36" FOR A 1-HIGH LOAD (2 REQD).

HORIZONTAL PIECE, 2" X 6" X 47-3/4" (AS REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

STOP PIECE, 2" X 4" X 47-3/4" (AS REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

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

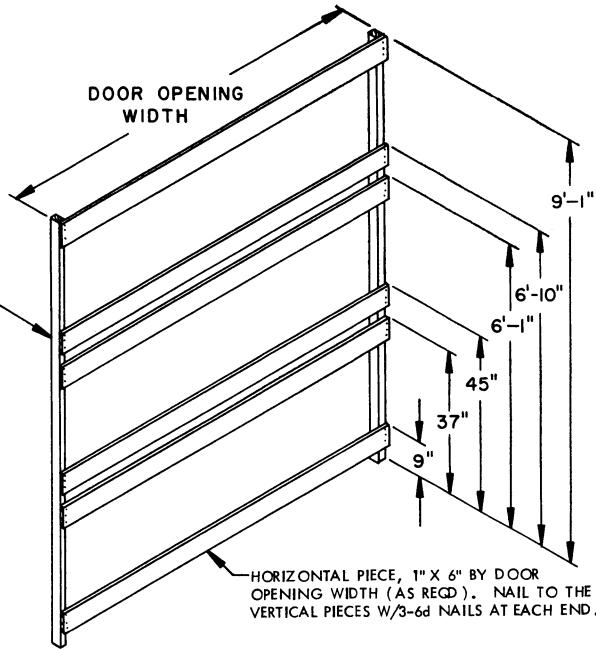
CENTER GATE H



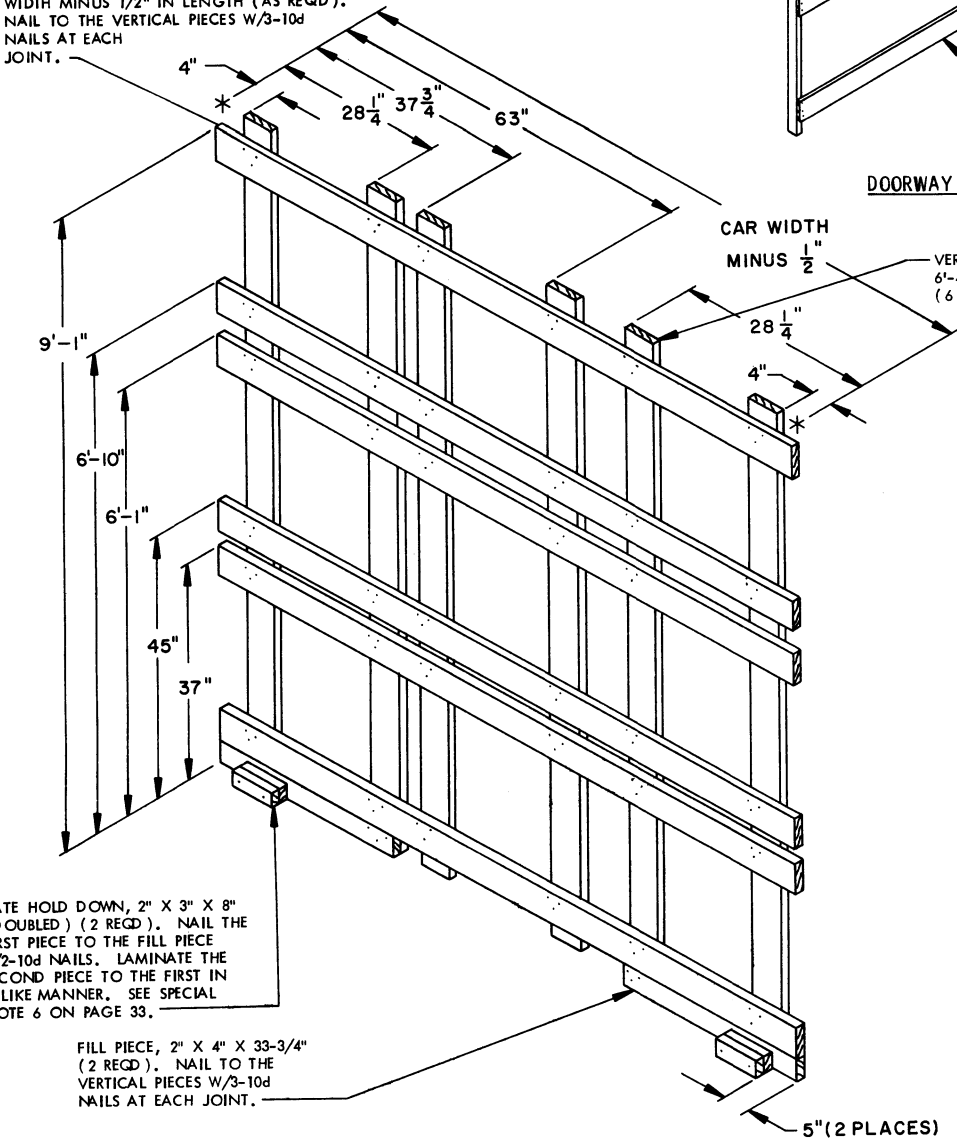
STRUT LEDGER, 2" X 2" OR 2" X 4" X 36" (AS REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

END VIEW

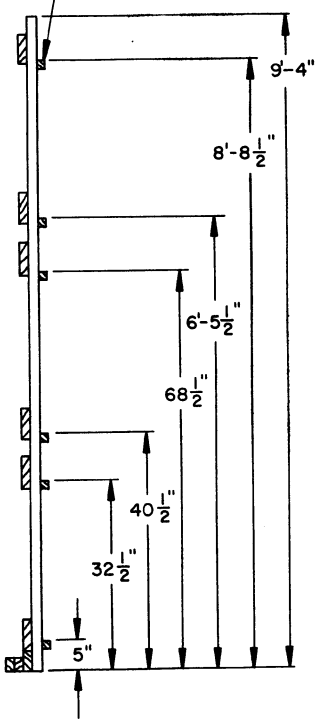
DETAILS FOR 4-LAYER PALLET UNIT



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



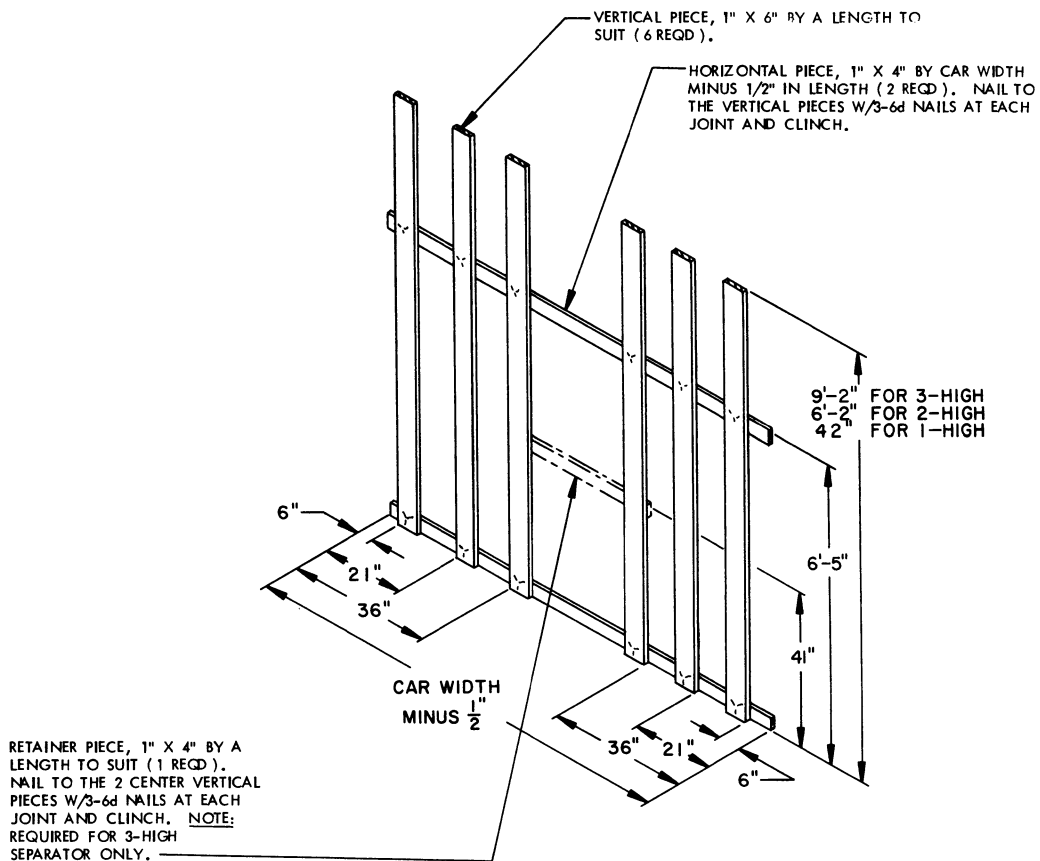
STRUT LEDGER, 2" X 2" OR 2" X 4" BY CAR WIDTH MINUS 8" IN LENGTH (AS REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



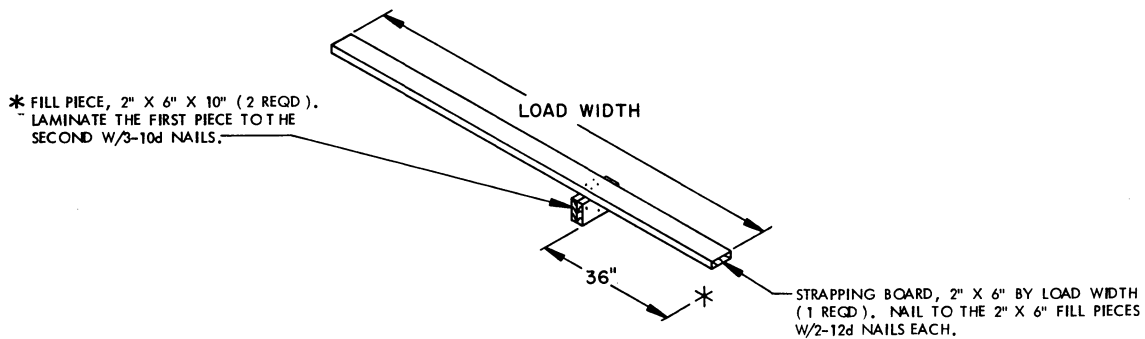
CENTER GATE J

(1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED)

DETAILS FOR 4-LAYER PALLET UNIT

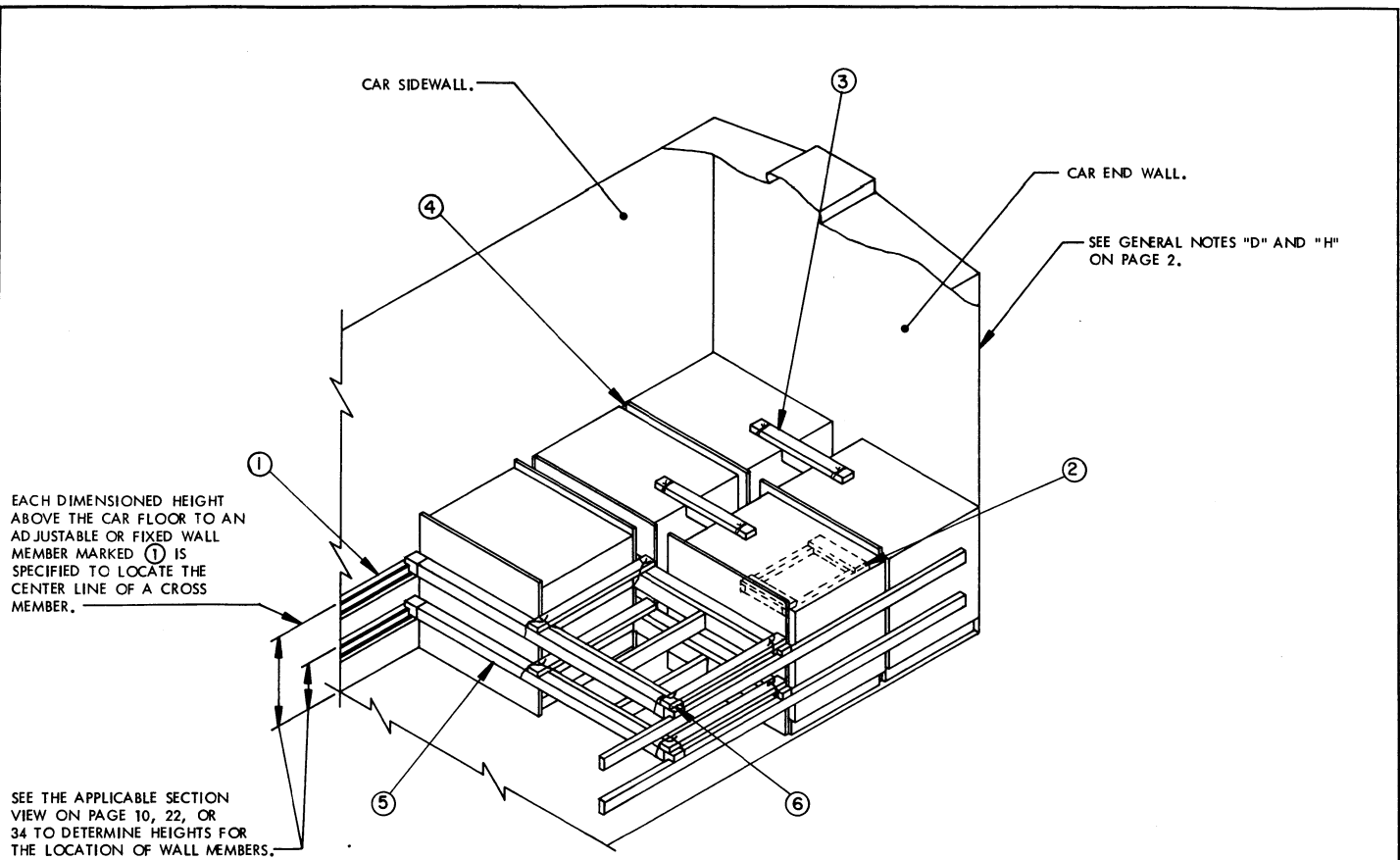


SEPARATOR GATE C



STRAPPING BOARD ASSEMBLY

* THE DEPICTED STRAPPING BOARD ASSEMBLY IS FOR USE IN A 9'-4" WIDE CAR. ADJUST THE QUANTITY OF FILL PIECES FOR WIDER CARS.



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 PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 5-LAYER PALLET UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS DEPICTED ON PAGE 4 OF THIS DRAWING.
3. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH. SEE NOTE ● BELOW.
5. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑥, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR END WALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE END WALL IS WOOD-LINED, CUT THE ADJACENT ENDS OFF THE SUPPORT PIECES FLUSH WITH THE LATERAL PIECE. EACH ASSEMBLY CAN THEN BE SUPPORTED BY NAILING THE LATERAL PIECE TO THE CAR END WALL W/6-10d NAILS. IF THE END WALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

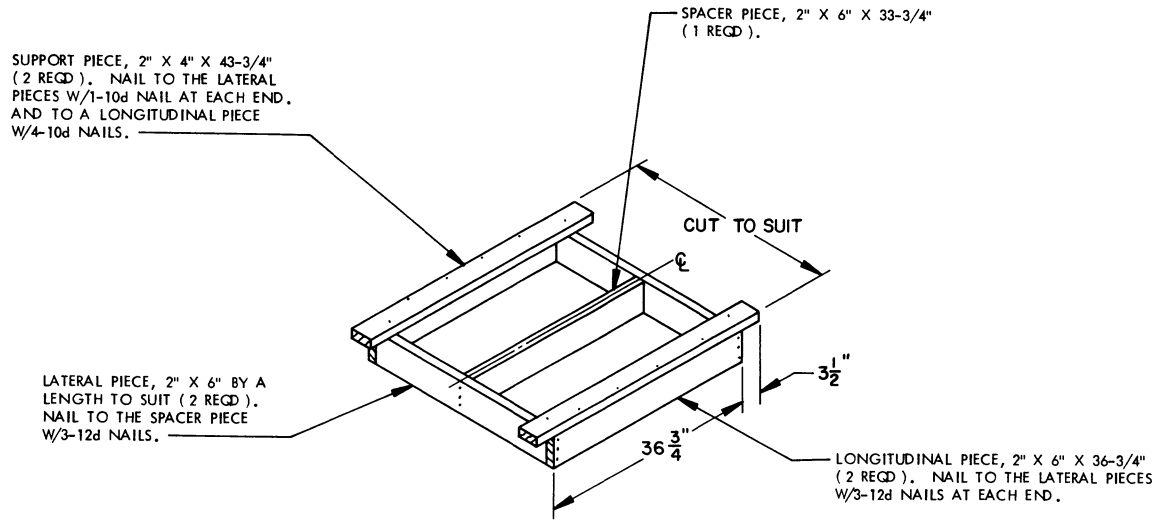
KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ⑤.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO PALLET UNITS AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76.
- ④ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 4' SHEET (6 REQD). POSITION AGAINST UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED ② W/1-6d NAIL EACH. NOTE THAT 1/2" WILL HAVE TO BE CUT OFF THE END OF SEPARATOR GATES WHICH ARE ADJACENT TO PIECES MARKED ⑥.
- ⑤ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "Y" ON PAGE 3.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 43 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBER W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

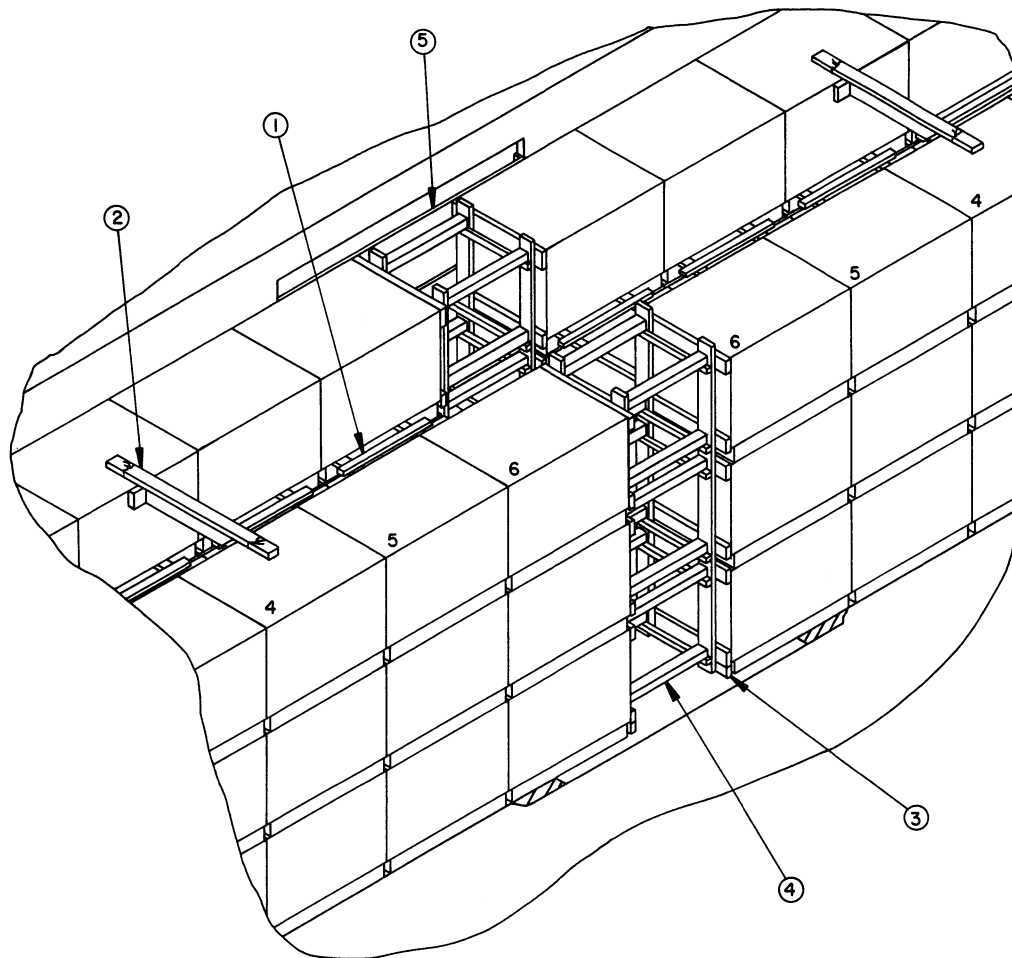
NOTE ●:

ALTHOUGH SPECIAL NOTE 4 SPECIFIES THAT FOUR (4) TOP-OF-LOAD ANTI-SWAY BRACES ARE REQUIRED IN EACH END OF A LOAD, THIS MAY NOT ALWAYS APPLY SUCH AS SHOWN IN THE ISOMETRIC VIEW ABOVE. THE FOUR (4) BRACE REQUIREMENT WILL ONLY APPLY TO A LOAD OF EIGHT OR MORE PALLET UNITS.

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



SPACER ASSEMBLY



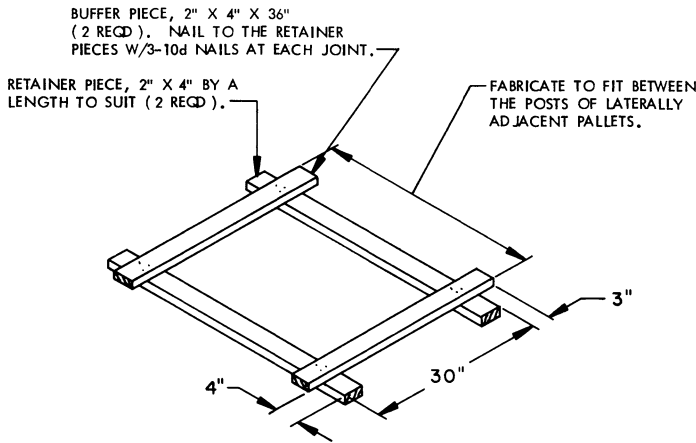
ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE METHOD OF OMITTING THE CENTER ROW OF UNITS FROM THE TOP LAYER. THE PALLET UNIT SHOWN IS THE 4-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER CROSSWISE-POSITIONED UNITS COVERED BY THIS DOCUMENT.
2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE CENTER ROW OF UNITS FROM THE TOP LAYER OF A 3-HIGH LOAD ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR A 2-HIGH LOAD.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE CENTER ROW OF UNITS FROM THE TOP LAYER ARE SHOWN.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② ABOVE MUST BE INSTALLED IN EACH END OF THE CAR. FIVE (5) BRACES ARE REQUIRED IN EACH END OF THE LOAD IN A 60' CAR. FOUR (4) BRACES ARE REQUIRED IN EACH END OF 40' AND 50' CARS.
5. THE CENTER GATE "J" (MODIFIED) IS ONLY APPLICABLE FOR THE 4-LAYER UNIT DEPICTED. 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, ANTI-SWAY BRACES, AND CRIB FILL PIECES IF USED, WILL ALSO VARY DEPENDENT UPON THE UNIT BEING LOADED. NOTE THAT 2-HIGH CRIB FILL WILL BE USED IN LIEU OF THE SPECIFIED 3-HIGH CRIB FILL PIECES.

KEY NUMBERS

- ① ANTI-SWAY BRACE (12 REQD.). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 45. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 3 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD.). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 45. WIRE TIE TO PALLET STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 76. SEE SPECIAL NOTE 4 AT LEFT.
- ③ CENTER GATE (2 REQD.; 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "CENTER GATE J" DETAIL ON PAGE 40. SEE SPECIAL NOTE 5 AT LEFT, AND THE "CENTER GATE MODIFICATION" DETAIL ON PAGE 45.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 27") (32 REQD.). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ⑤ DOORWAY PROTECTION (2 REQD.). SEE THE "DOORWAY PROTECTION F" DETAIL ON PAGE 40. NAIL TO THE DOOR POSTS W/12 NAILS.



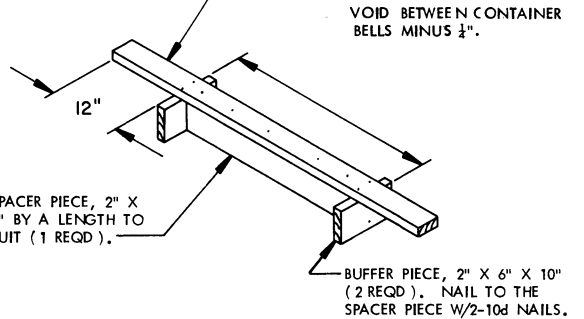
ANTI-SWAY BRACE B

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.

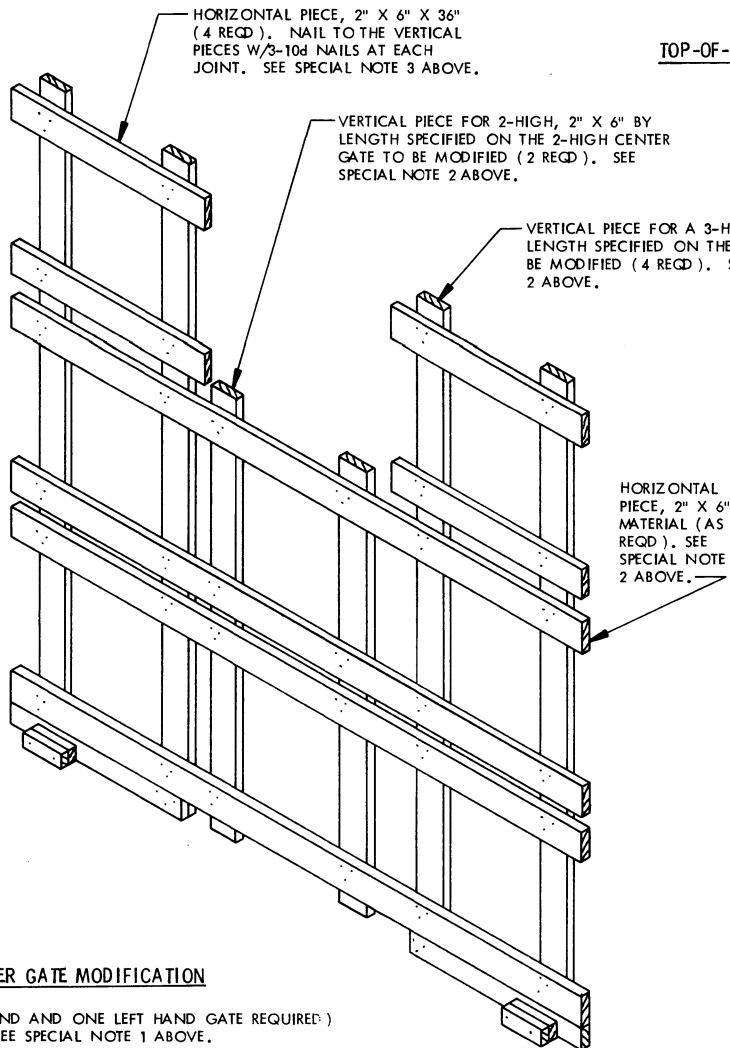
SPECIAL NOTES:

1. THE PROCEDURES FOR THE MODIFICATION OF A 3-HIGH CENTER GATE ARE SHOWN AS TYPICAL, HOWEVER, THE PRINCIPLES MAY ALSO BE APPLIED FOR A 2-HIGH CENTER GATE.
2. THE "CENTER GATE MODIFICATION" DETAIL BELOW ONLY SPECIFIES THE CHANGES NECESSARY TO MODIFY A CENTER GATE FOR USE IN A LOAD WHERE THE CENTER ROW OF THE TOP TIER IS OMITTED. REFER TO THE PROPER CENTER GATE TO BE USED FOR THE PALLET UNIT TO BE SHIPPED FOR DIMENSIONS AND NAILING GUIDANCE NOT SPECIFIED HEREIN.
3. THE LENGTH OF THE 2" X 6" X 36" HORIZONTAL PIECES, AND THE 2" X 2" X 30" STRUT LEDGERS WILL BE THE SAME FOR ALL MODIFIED CENTER GATES.

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

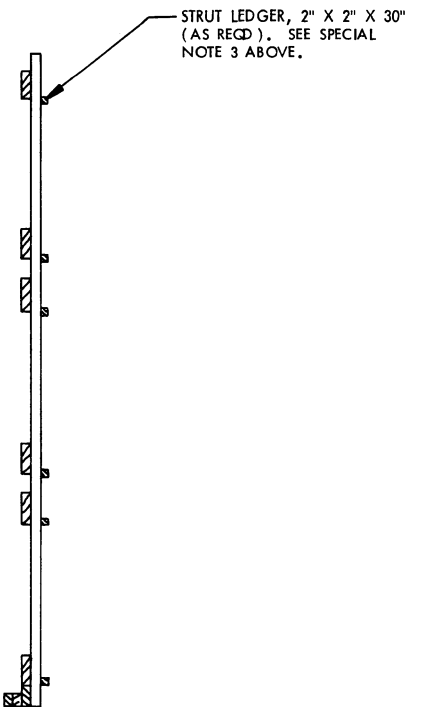


TOP-OF-LOAD ANTI-SWAY BRACE B



CENTER GATE MODIFICATION

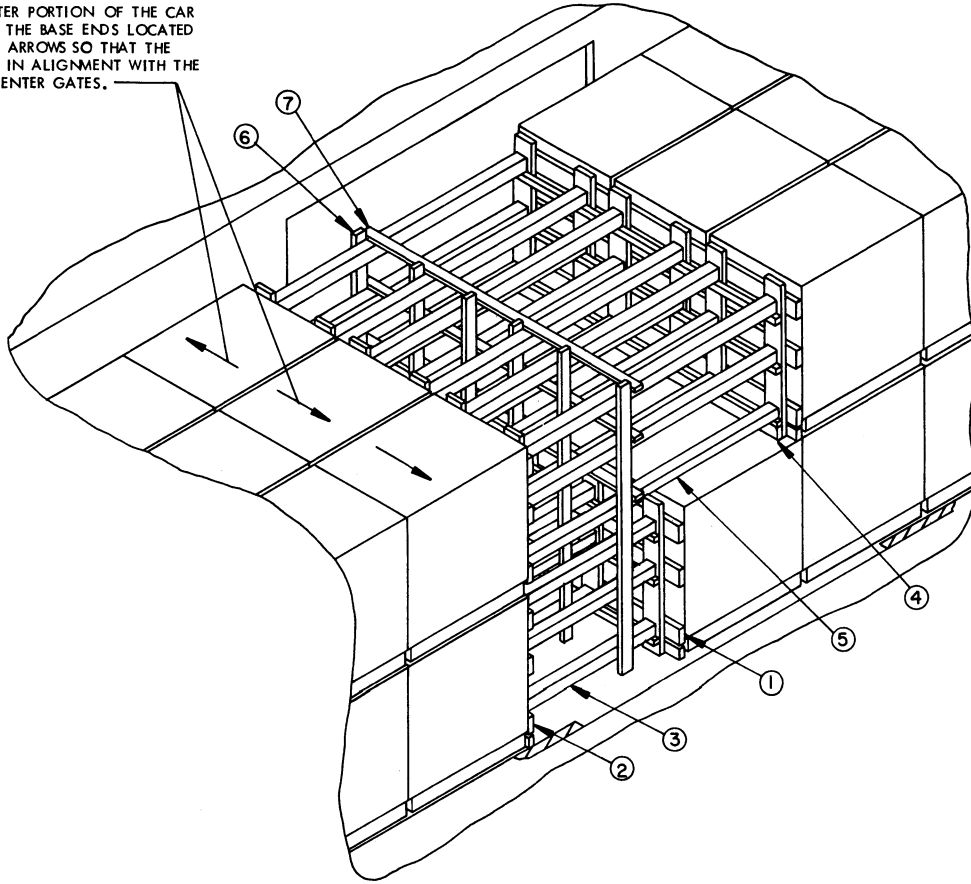
(ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED)
SEE SPECIAL NOTE 1 ABOVE.



END VIEW

DETAILS

PALLET UNITS IN THE CENTER PORTION OF THE CAR MUST BE POSITIONED WITH THE BASE ENDS LOCATED IN THE DIRECTION OF THE ARROWS SO THAT THE PALLET DUNNAGE WILL BE IN ALIGNMENT WITH THE VERTICAL PIECES OF THE CENTER GATES.



ISOMETRIC VIEW

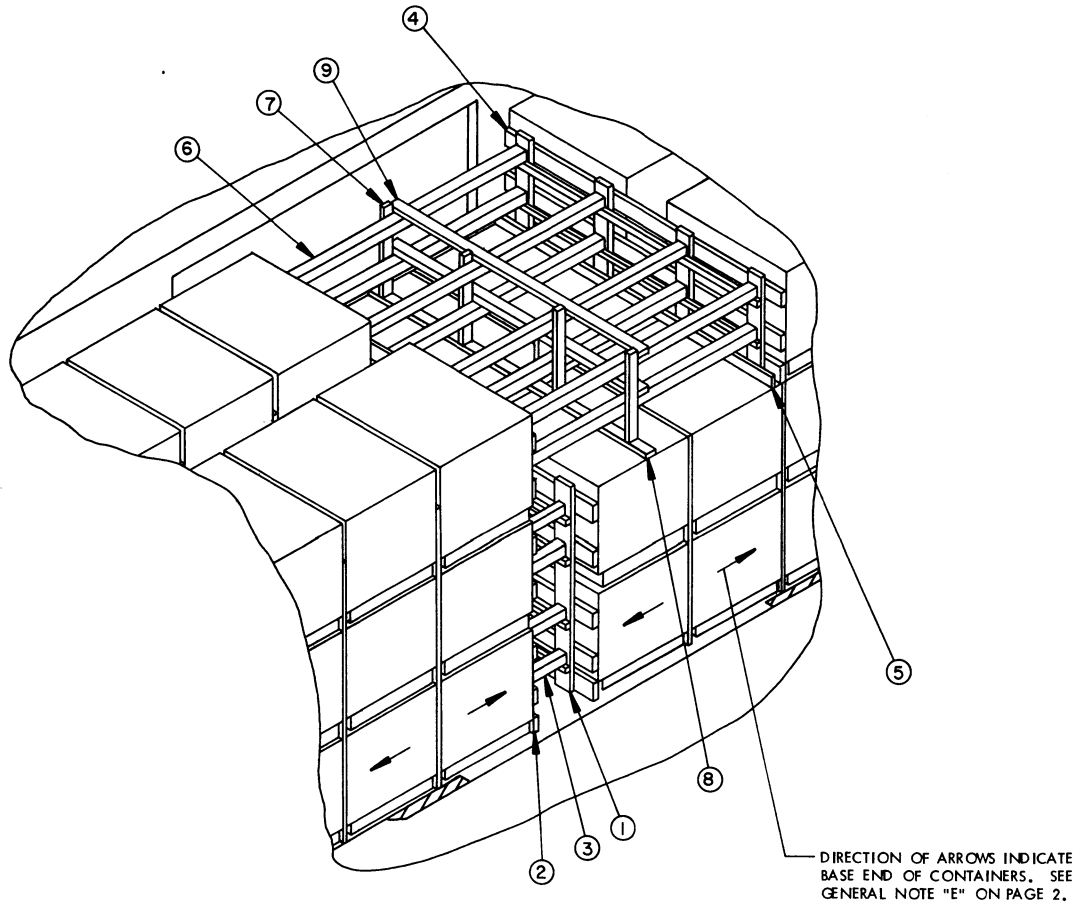
SPECIAL NOTES:

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. WIDER CARS CAN ALSO BE USED.
2. THE PALLET UNIT SHOWN IS THE 6-LAYER UNIT. 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 THREE (3) UNITS FROM THE TOP LAYER OF 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. THE CENTER GATE "C" USED IS ONLY APPLICABLE FOR THE BASIC HEIGHT (6-LAYER) UNIT DEPICTED. 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.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 16. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 5 AT THE LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 16.
- 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 NOTE "M" ON PAGE 2. SEE GENERAL NOTES "V" AND "W" ON PAGE 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 3" ABOVE THE TOP 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 1/2" IN LENGTH (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

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



ISOMETRIC VIEW

SPECIAL NOTES:

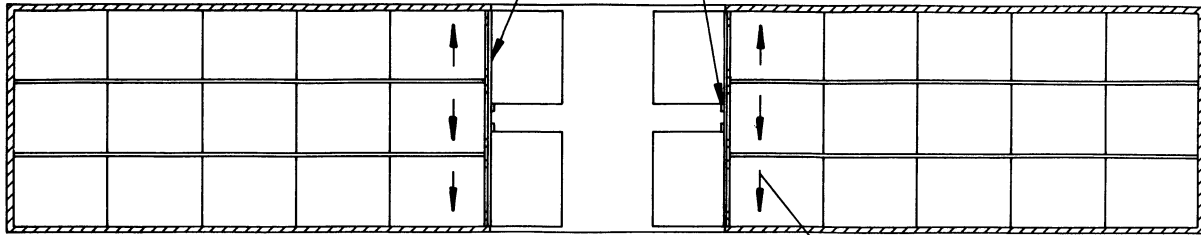
1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. THE PALLET UNIT SHOWN IS THE 4-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM TWO (2) LOAD UNITS ARE SHOWN AS TYPICAL. THE PRINCIPLES MAY ALSO BE APPLIED FOR THE OMISSION OF THE TOP LAYER FROM JUST ONE (1) LOAD UNIT.
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 GATE "L" USED IS ONLY APPLICABLE FOR THE 4-LAYER UNIT DEPICTED. 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 (8), 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 G" DETAIL ON PAGE 38. SEE SPECIAL NOTE 5 AT LEFT.
- (2) CENTER GATE FOR 3-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 38.
- (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 NOTE "V" AND "W" ON PAGE 3.
- (4) CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE G" DETAIL ON PAGE 38.
- (5) SUPPORT PIECE, 2" X 4" BY CAR WIDTH MINUS 10" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES ON CENTER GATE "G", SHOWN AS PIECE MARKED (4).
- (6) STRUT, 4" X 4" BY CUT TO FIT (8 REQD). TOENAIL TO PIECES MARKED (2) AND (4) W/2-16d NAILS AT EACH END.
- (7) VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (4 REQD). NAIL TO THE STRUTS MARKED (3) AND (6) W/3-10d NAILS AT EACH JOINT.
- (8) STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN. SEE SPECIAL NOTE 6.
- (9) HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

SEPARATOR GATE (1 OR 2 REQD, AS APPLICABLE). SEE THE "SEPARATOR GATE D" DETAIL ON PAGE 49. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE CROSSWISE POSITIONED PALLET UNITS (RIGHT HAND AND LEFT HAND SEPARATOR GATES ARE REQUIRED).

STOP PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION SO AS TO BE IN CONTACT WITH THE ADJACENT PALLET UNIT. SECURE BY NAILING THRU THE STOP PIECE, OR THE HORIZONTAL PIECES OF THE SEPARATOR GATE, W/3-APPLICABLY SIZED 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

10 CROSSWISE PLUS 2 LENGTHWISE LOAD UNITS ARE SHOWN.

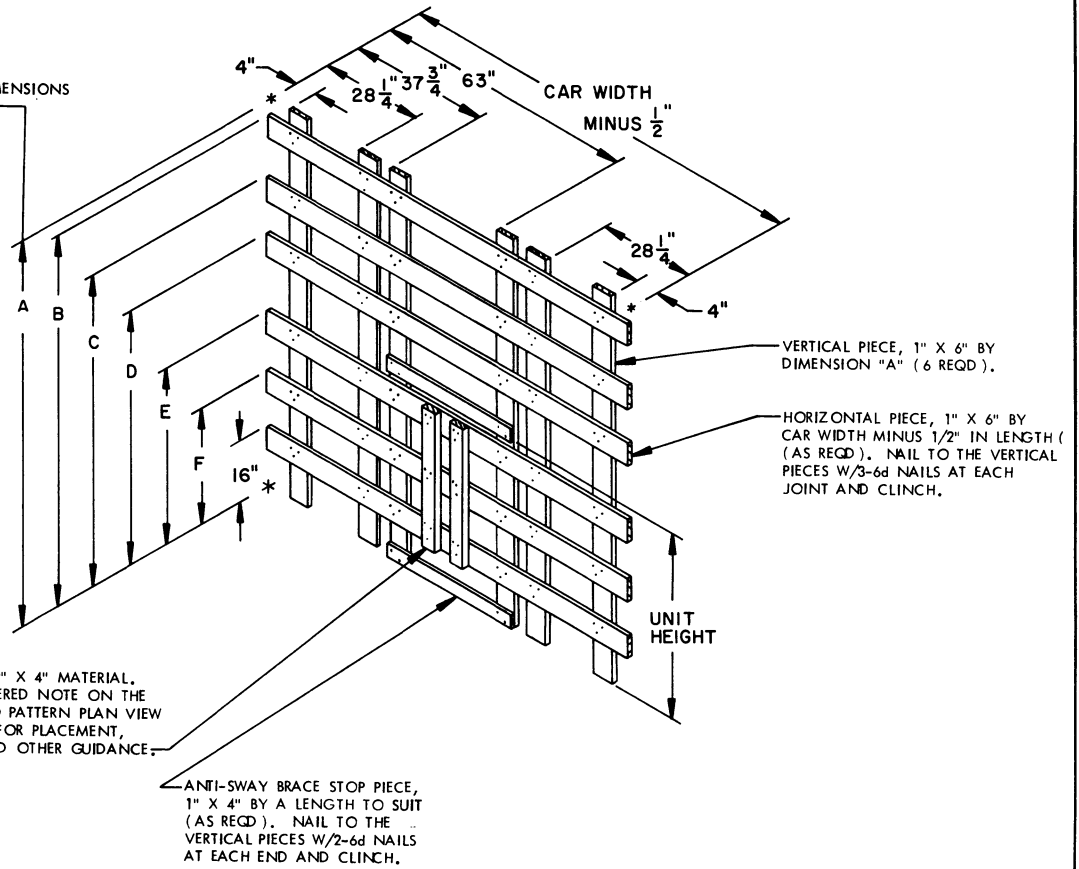
PALLET UNITS IN THE CENTER PORTION OF THE CAR MUST BE POSITIONED WITH THE BASE ENDS LOCATED IN THE DIRECTION OF THE ARROWS SO THAT THE PALLET DUNNAGE WILL BE IN ALIGNMENT WITH THE VERTICAL PIECES OF THE SEPARATOR GATES.

PALLET UNIT			
CAR LENGTH	UNITS PER LAYER	LOAD PATTERN	APPROX STRUT LENGTH
40'-6" CAR	27	CROSSWISE LOAD ON PAGE 8, 20, OR 32	50"
	28	8 LONG AT 47-3/4" PLUS 2 AT 36"	23"
	25	5 LONG AT 47-3/4" PLUS 5 AT 36"	56"
	24	LENGTHWISE LOAD ON PAGE 6, 18, OR 30	42"
50'-6" CAR	36	CROSSWISE LOAD ON PAGE 8, 20, OR 32	27"
	35	11 LONG AT 47-3/4" PLUS 1 AT 36"	37"
	34	10 LONG AT 47-3/4" PLUS 2 AT 36"	47"
	32	LENGTHWISE LOAD ON PAGE 6, 18, OR 30	18"
60'-8" CAR	42	CROSSWISE LOAD ON PAGE 8, 20, OR 32	53"
	41	13 LONG AT 47-3/4" PLUS 1 AT 36"	63"
	42	12 LONG AT 47-3/4" PLUS 3 AT 36"	37"
	40	10 LONG AT 47-3/4" PLUS 5 AT 36"	60"
	38	LENGTHWISE LOAD ON PAGE 6, 18, OR 30	31"

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 49 ARE PRESENTED TO PROVIDE A METHOD OR 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 GATES "D", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "D" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE CROSSWISE UNITS OF THE LOAD.
4. A CHART FOR THE VARIOUS QUANTITIES (PER LAYER) WHICH CAN BE ATTAINED BY THE COMBINATION LOAD METHOD, AND THE PATTERNS REQUIRED TO PROVIDE THESE QUANTITIES, ARE SPECIFIED. FOR COMPARISON PURPOSES, THE OTHER TYPE LOADS WHICH CAN BE USED TO ATTAIN A LIKE QUANTITY, OR A QUANTITY WITHIN THE RANGE OF THE COMBINATION LOAD METHOD, AS WELL AS THE APPROXIMATE LENGTH OF THE STRUTS, ARE ALSO INCLUDED IN THE CHART.

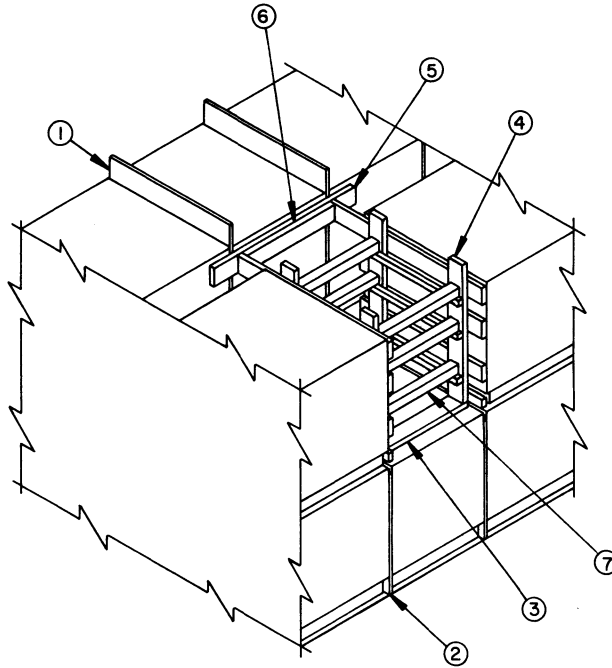
SEE CHART BELOW FOR DIMENSIONS REPRESENTED BY LETTERS.



SEPARATOR GATE D

THIS VIEW DEPICTS A SEPARATOR GATE APPLICABLE TO ALL OF THE UNITS COVERED BY THIS DOCUMENT. RIGHT HAND AND LEFT HAND SEPARATOR GATES ARE REQUIRED.

PALLET UNIT IDENTIFICATION	DIMENSIONS					
	A	B	C	D	E	F
6-LAYER UNIT	8'-6"	8'-2"	6'-10"	67"	46"	31"
5-LAYER UNIT	7'-6"	7'-3"	6'-4"	60"	44"	31"
4-LAYER UNIT	8'-10"	8'-7"	----	67"	52"	----



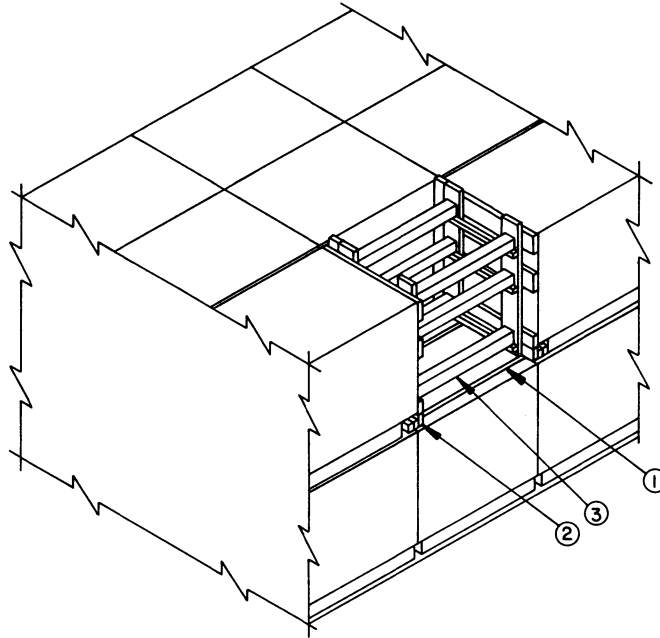
ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USE.
2. THE PALLET UNIT SHOWN IS THE 5-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER LOAD IS SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR THE OMISSION OF A TOP LAYER PALLET UNIT FROM A 3-LAYER LOAD.
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. NOTE THAT SEPARATOR GATE MARKED ① MUST BE NOTCHED TO ACCOMMODATE THE ANTI-SWAY BEARING PIECE MARKED ⑤; ALSO, SEPARATOR GATES MARKED ① AND ② MUST BE NAILED TO AN ADJACENT ANTI-SWAY BRACE AS DIRECTED ON THE APPLICABLE LOAD PAGE.

KEY NUMBERS

- ① SEPARATOR GATE, 3/8" THICK PLYWOOD, 4' X 8' SHEET (2 REQD). POSITION AS SHOWN IN LOAD VIEW ABOVE. SEE SPECIAL NOTE 6 AT LEFT FOR GATE MODIFICATIONS AND NAILING GUIDANCE.
- ② SEPARATOR GATE, 3/8" THICK PLYWOOD, 4' X 4' SHEET (2 REQD).
- ③ SUPPORT PIECE, 2" X 6" X 36" (2 REQD). POSITION SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ④.
- ④ LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE DETAIL ON PAGE 52. NAIL TO THE FILLER PIECE, PIECE MARKED ⑥, W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ③, W/2-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL " INTO A CONTAINER.
- ⑤ ANTI-SWAY BEARING PIECE, 2" X 6" X 48" (1 REQD).
- ⑥ FILLER PIECE, 2" X 6" X 33-3/4" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ⑤, W/5-10d NAILS.
- ⑦ STRUT, 4" X 4" BY CUT TO FIT (REF: 31") (AS REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END.



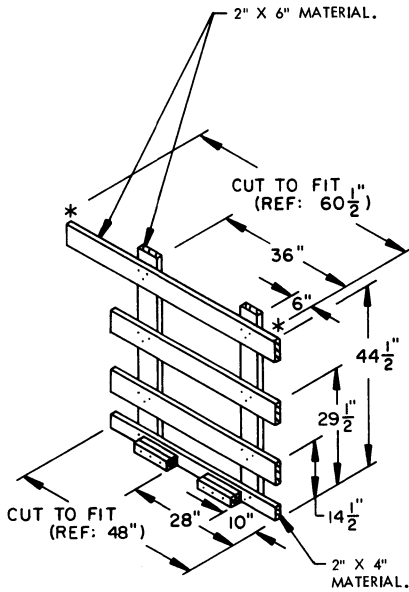
ISOMETRIC VIEW

SPECIAL NOTES:

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

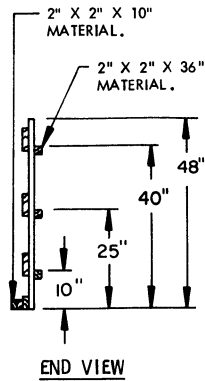
KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" BY UNIT WIDTH (2 REQ). POSITION BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQ, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE DETAIL ON PAGE 53. 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: 42") (4 REQ). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.

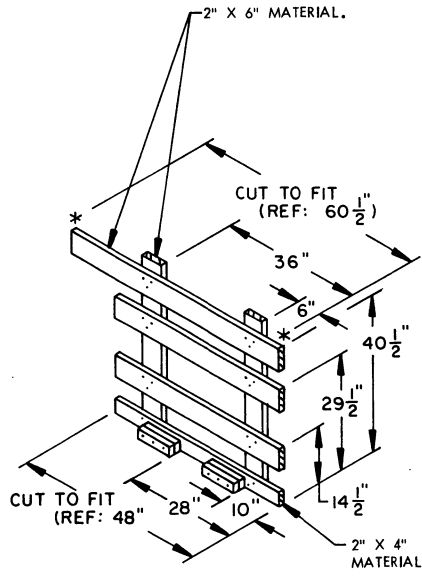


LOAD BEARING GATE A

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

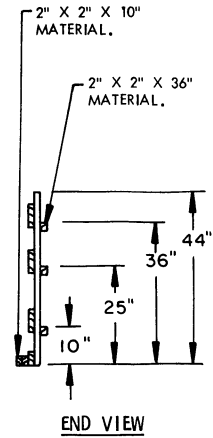


END VIEW



LOAD BEARING GATE B

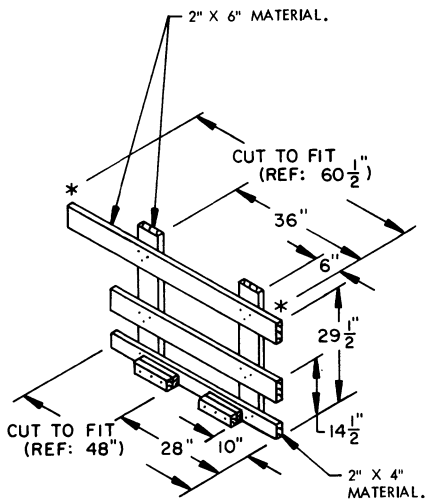
THIS GATE IS FOR USE IN A LOAD OF 5-LAYER PALLET UNITS. SEE SPECIAL NOTE 3 BELOW FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.



END VIEW

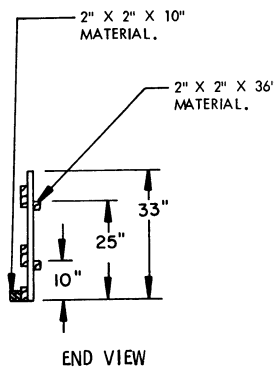
SPECIAL NOTES:

1. THE GATES SHOWN ON THIS PAGE ARE FOR USE WITH ALL OF THE PALLET UNITS SHOWN ON PAGE 4 OF THIS DRAWING. A 5-LAYER UNIT IS SHOWN IN THE LCL PROCEDURES SHOWN ON PAGE 50. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF LENGTHWISE-POSITIONED 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.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 4" OR 2" X 6" HORIZONTAL PIECE (5) TO THE 2" X 6" VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 2" GATE HOLD DOWN PIECES TO A 2" X 4" HORIZONTAL PIECE W/3-10d NAILS EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

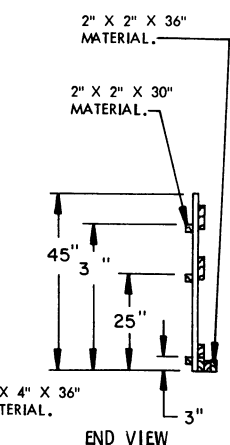
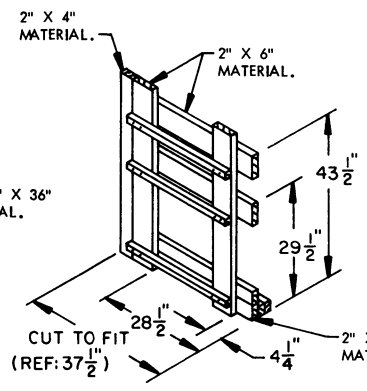
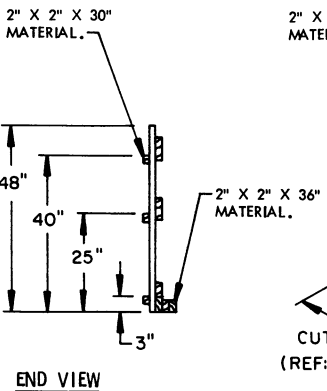
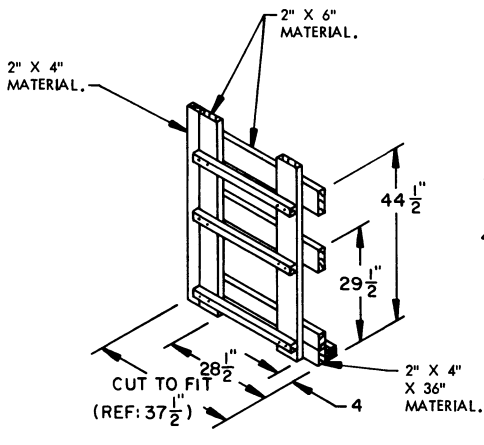


LOAD BEARING GATE C

THIS GATE IS FOR USE IN A LOAD OF 4-LAYER PALLET 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.



END VIEW

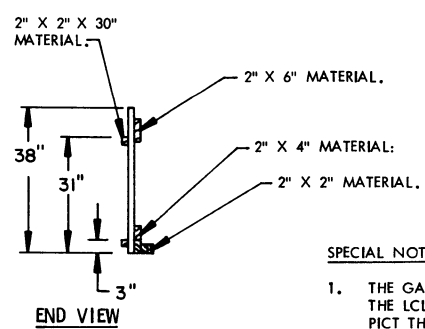
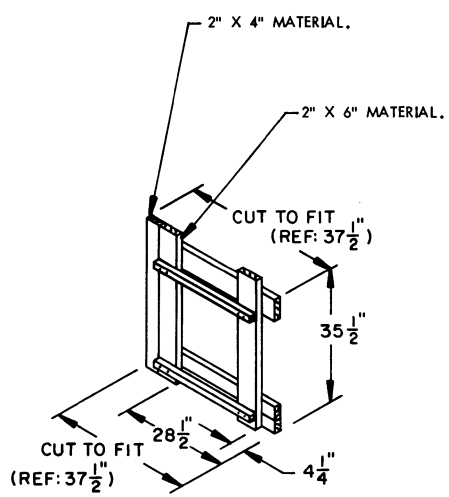


LOAD BEARING GATE D

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

LOAD BEARING GATE E

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



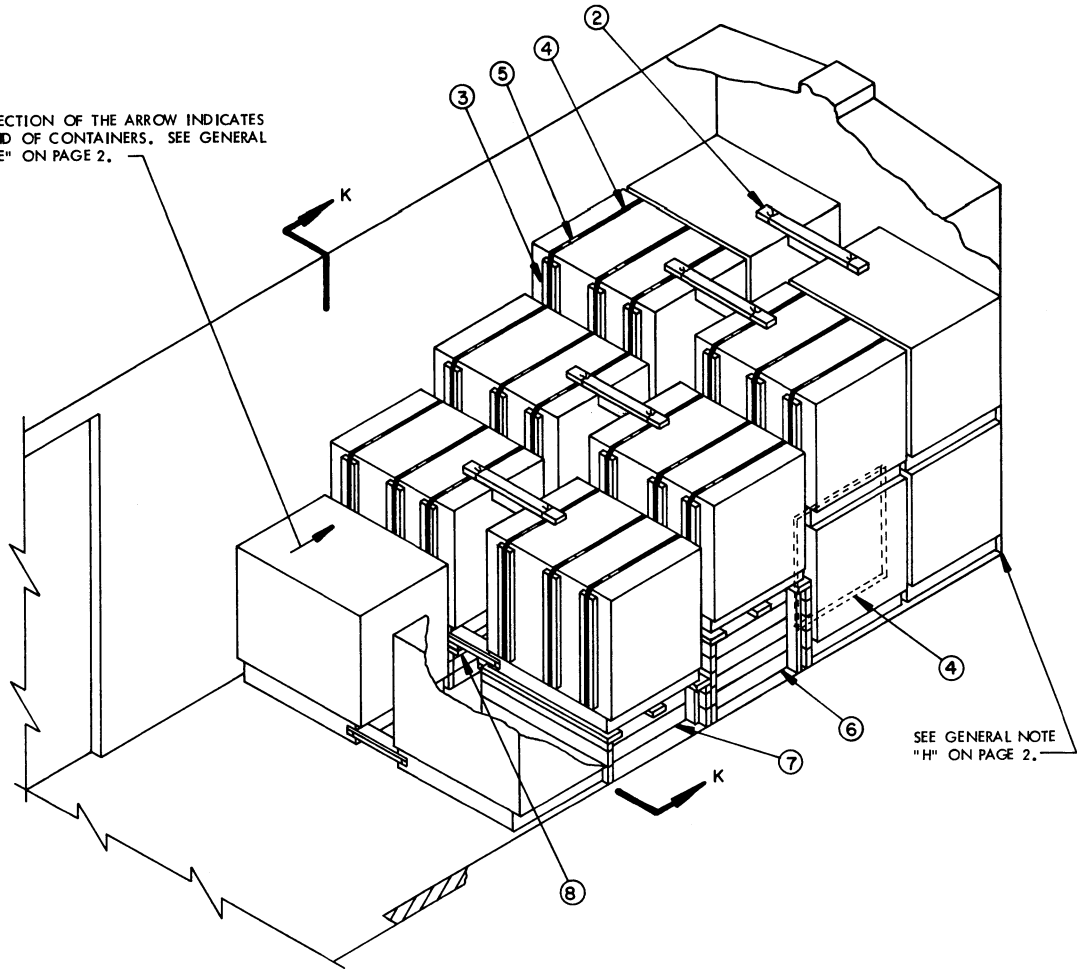
LOAD BEARING GATE F

THIS GATE IS USED FOR USE IN A LOAD OF 4-LAYER PALLET UNITS. SEE SPECIAL NOTE 3 AT RIGHT FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A RIGHT HAND GATE IS SHOWN.

SPECIAL NOTES:

1. THE GATES ON THIS PAGE ARE FOR USE WITH ALL OF THE UNITS IN THE LCL PROCEDURES SHOWN ON PAGE 51. THOSE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CROSS-POSITIONED PALLET UNITS.
2. THE REFERENCED DIMENSION GIVEN FOR THE CUT-TO-FIT PIECES IS BASED ON AN INSIDE CAR WIDTH OF 9'-2". THIS DIMENSION WILL HAVE TO BE INCREASED WHEN LOADING WIDER CARS.
3. THE NAILING OF THE VARIOUS PARTS OF THE GATES WILL BE AS FOLLOWS: NAIL THE 2" X 4" OR 2" X 6" HORIZONTAL PIECE (S) 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/6-10d NAILS AT EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

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

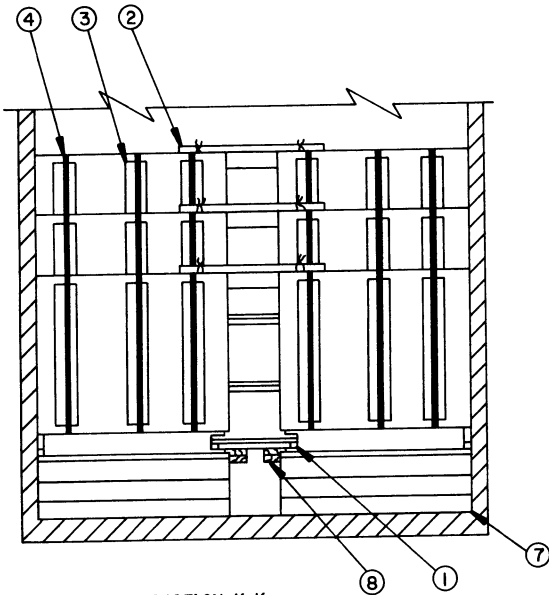


SEE GENERAL NOTE
"H" ON PAGE 2.

ISOMETRIC VIEW

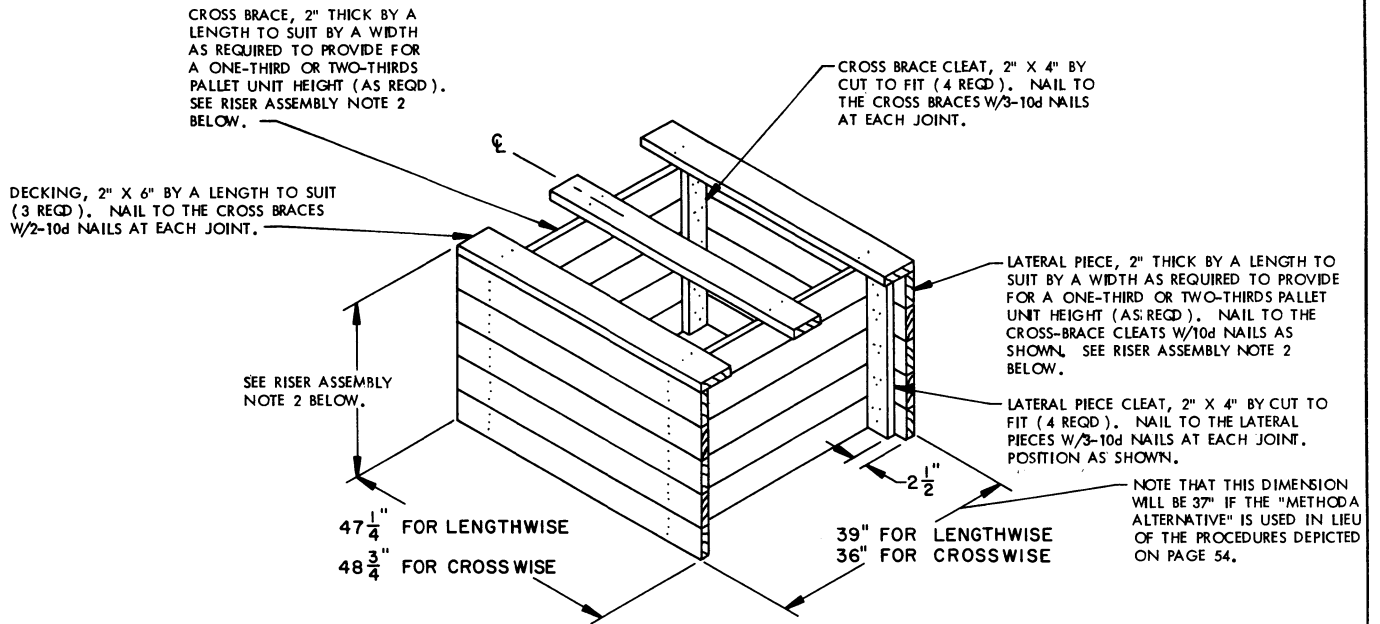
KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 55.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76.
- ③ STRAPPING BOARD, 2" X 6" X 45" (48 REQD, 6 PER PALLET UNIT). POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 56. SEE SPECIAL NOTES 6 AND 7 ON PAGE 55.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 16'-6" LONG (REF) STEEL STRAPPING (24 REQD). INSTALL TO ENCIrcLE THE PALLET UNIT AND THE STRAPPING BOARDS. SECURE TO A STRAPPING BOARD W/3 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 56.
- ⑤ SEAL FOR 1-1/4" STRAPPING (48 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- ⑥ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 55.
- 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 55.
- ⑧ STOP PIECE, (4 REQD). SEE THE "STOP PIECE LOCATION" DETAIL ON PAGE 57 FOR LOCATION AND NAILING GUIDANCE.



SECTION K-K

TYPICAL LCL LOAD USING RISER METHOD OF PARTIAL-LAYER BRACING



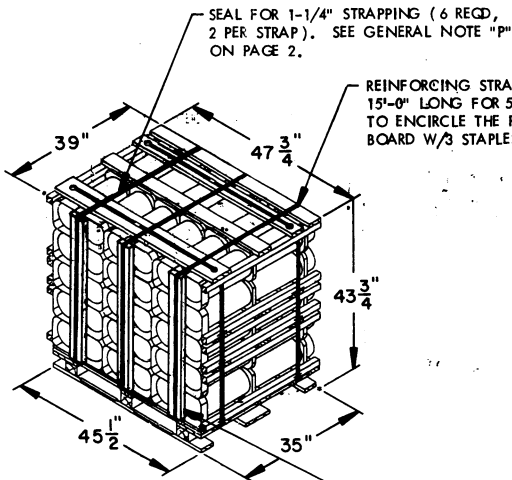
RISER ASSEMBLY

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 PALLET UNIT SHOWN IN THE TYPICAL LOAD ON PAGE 54 IS THE 5-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. THE RISER METHOD OF PARTIAL-LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED LENGTHWISE IN THE CAR. THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE-POSITIONED UNITS. SEE SPECIAL NOTE 7.
4. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. ANTI-SWAY BRACE "A" IS APPLICABLE FOR ALL THE LENGTHWISE-POSITIONED UNITS. NOTE THAT STOP PIECES, SHOWN AS PIECE MARKED (B) ON PAGE 54, ARE REQUIRED ON THE ANTI-SWAY BRACES WHICH ARE LOCATED OVER THE LATERALLY ADJACENT RISER ASSEMBLIES.
6. IF DESIRED, PLYWOOD "SIDE FILL A" DETAILED ON PAGE 56 MAY BE USED IN LIEU OF PIECES MARKED (C). SEE THE "METHOD A ALTERNATIVE" DETAIL ON PAGE 56 FOR GUIDANCE.
7. FOR CROSSWISE POSITIONED UNITS, THE STRAPPING BOARDS SHOWN AS PIECES MARKED (C) WILL NOT BE REQUIRED. SEE THE "METHOD B", DETAIL ON PAGE 57 FOR MODIFICATION TO BE ACCOMPLISHED IN LIEU OF USING STRAPPING BOARDS. ALSO, IF THE UNITS ARE POSITIONED CROSSWISE, 3-PALLET STACKS WILL BE POSITIONED ACROSS THE WIDTH OF THE CAR, AND CRIB FILL WILL BE POSITIONED IN THE LATERAL VOID. FOR CRIB FILL LOCATED BETWEEN THE RISER ASSEMBLIES, THE HEIGHT OF THE TOP HORIZONTAL PIECES MUST BE ADJUSTED; USE THE SPECIFIED HEIGHT FOR A 1-HIGH CRIB FILL, PLUS THE RISER ASSEMBLY HEIGHT.

SPECIAL NOTES FOR RISER ASSEMBLY:

1. THE TYPICAL RISER ASSEMBLY SHOWN ABOVE IS FOR THE 6-LAYER (BASIC HEIGHT) UNIT. THE HEIGHT OF THE BASIC UNIT IS 51-1/4". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER (B) IN THE LOAD ON PAGE 54. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FIVE (5) PIECES OF 2" X 6" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 29" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER (C) IN THE LOAD ON PAGE 54, WILL BE FABRICATED FROM TWO (2) PIECES OF 2" X 6" AND ONE (1) PIECE OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 14-1/2" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATION 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. WHEN THE PALLET UNITS ARE POSITIONED LENGTHWISE, AS SHOWN ON PAGE 54, STOP PIECES WILL BE APPLIED TO THE ANTI-SWAY BRACE. SEE THE "STOP PIECE LOCATION" DETAIL ON PAGE 57 FOR GUIDANCE.

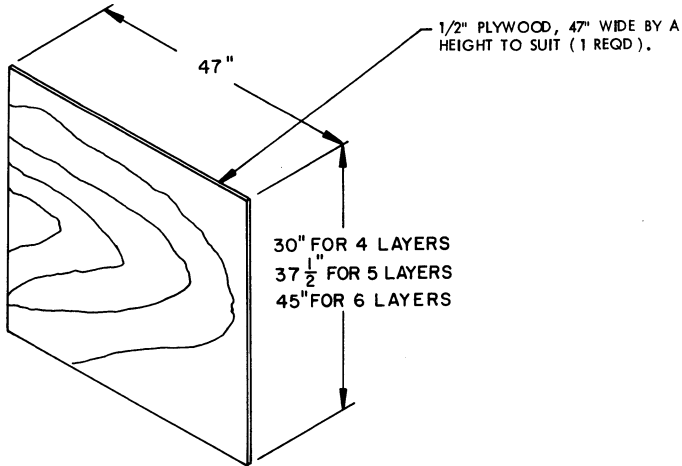


METHOD A

FOR ALL PALLET UNITS. THE 5-LAYER PALLET UNIT IS SHOWN. SEE NOTE BELOW.

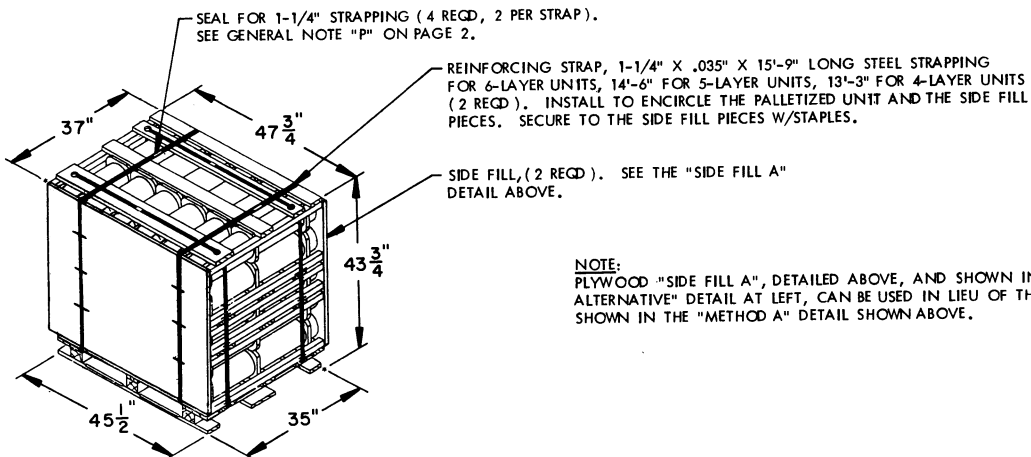
STRAPPING BOARD, 2" X 6" X 45" FOR 6-LAYER UNITS, 2" X 6" X 37" FOR 5-LAYER UNITS, 30" FOR 4-LAYER UNITS (6 REQD). CENTER THE OUTER STRAPPING BOARDS ON THE JOINTS OF THE CONTAINER; POSITION THE CENTER ONE 1" OFF-CENTER SO THE STRAP CLEARS THE CENTER POSTS.

NOTE:
THE "METHOD A" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR PALLET UNITS WHICH ARE TO BE POSITIONED LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 54. THE 5-LAYER UNIT IS SHOWN, HOWEVER, THE PROCEDURES ARE APPLICABLE FOR ALL OF THE UNITS COVERED IN THIS DOCUMENT. FOR MODIFICATION OF UNITS TO BE POSITIONED CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL ON PAGE 57.



SIDE FILL A

FOR "METHOD A ALTERNATIVE" BELOW.

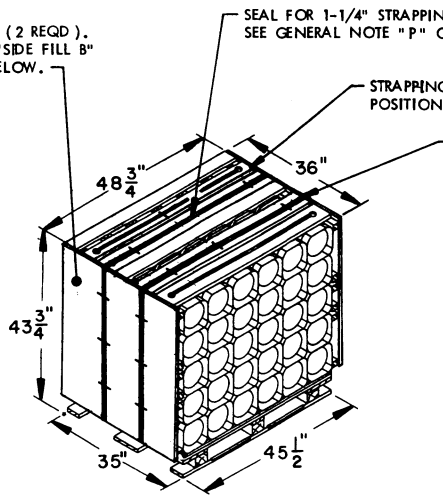


METHOD A ALTERNATIVE

FOR ALL UNITS. THE 5-LAYER PALLET UNIT IS SHOWN.

NOTE:
PLYWOOD "SIDE FILL A", DETAILED ABOVE, AND SHOWN IN THE "METHOD A ALTERNATIVE" DETAIL AT LEFT, CAN BE USED IN LIEU OF THE STRAPPING BOARDS SHOWN IN THE "METHOD A" DETAIL SHOWN ABOVE.

SIDE FILL (2 REQD).
SEE THE "SIDE FILL B"
DETAIL BELOW.

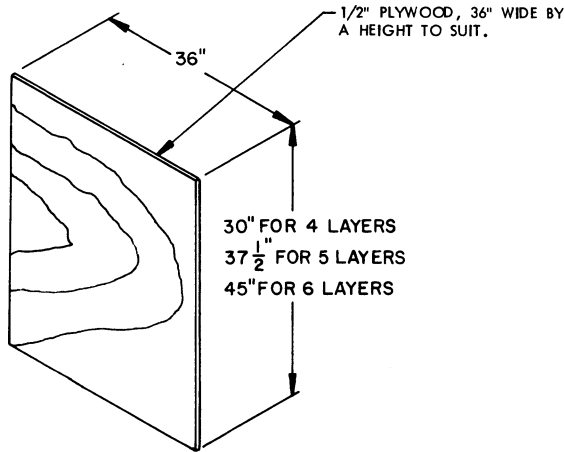


NOTE:

THE "METHOD B" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR THE PALLET UNITS WHICH ARE TO BE POSITIONED CROSSWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 54. THE 6-LAYER (BASIC HEIGHT) UNIT IS SHOWN, HOWEVER, THE PROCEDURE IS ALSO APPLICABLE FOR THE 5-LAYER AND 4-LAYER UNITS. FOR MODIFICATION OF UNITS TO BE POSITIONED LENGTHWISE IN A CAR, REFER TO THE "METHOD A" DETAIL, AND THE "METHOD A ALTERNATIVE" DETAIL ON PAGE 56.

METHOD B

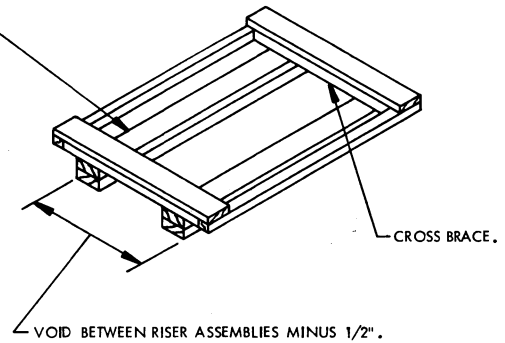
FOR ALL PALLET UNITS, THE 5-LAYER UNIT IS SHOWN.



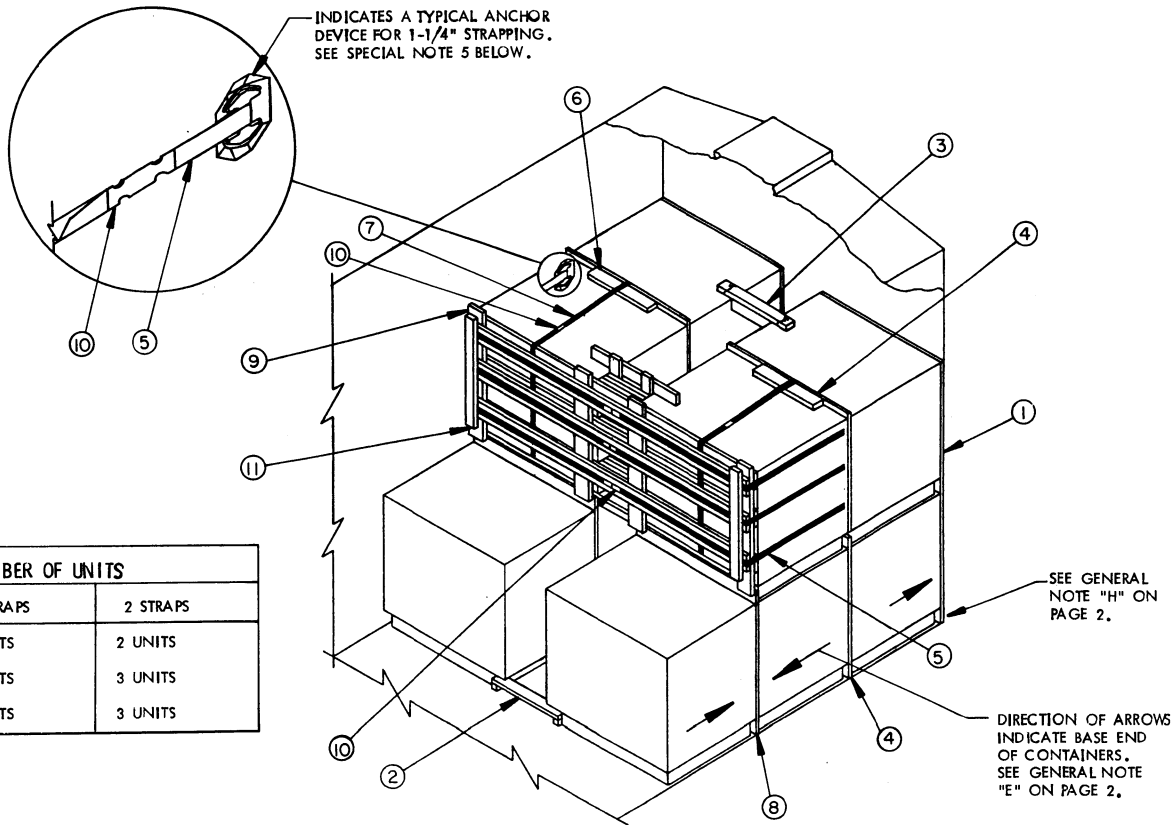
SIDE FILL B

FOR "METHOD B" ABOVE.

STOP PIECE, 2" X 4" X 36" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CROSS BRACE W/3-8d NAILS AT EACH END. NAIL THE SECOND PIECE TO THE FIRST W/5-10d NAILS.



STOP PIECE LOCATION DETAIL



MAXIMUM NUMBER OF UNITS		
UNIT SIZE	3 STRAPS	2 STRAPS
6-LAYER	3 UNITS	2 UNITS
5-LAYER	4 UNITS	3 UNITS
4-LAYER	5 UNITS	3 UNITS

ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-4" WIDE ALL-METAL BOX CAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 5-LAYER UNIT. 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 ABOVE 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 47 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 50 FOR A SINGLE UNIT.

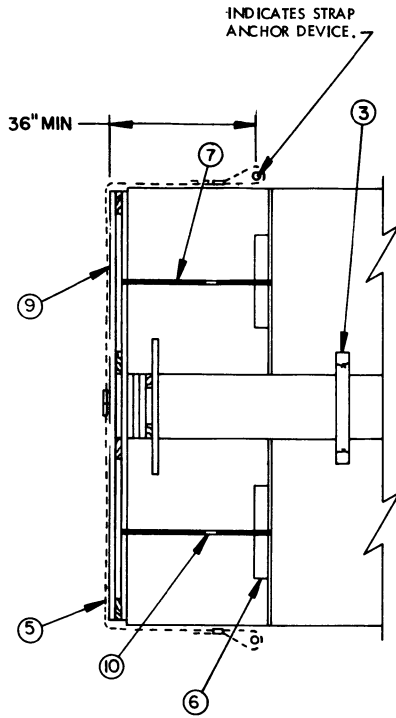
(CONTINUED ON PAGE 59)

KEY NUMBERS

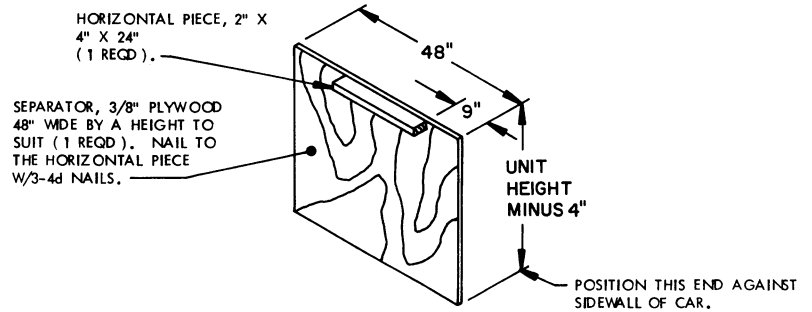
- 1 END-WALL LINING (1 REQD). SEE THE DETAIL ON PAGE 75. SEE GENERAL NOTE "D" ON PAGE 2. NOTE THAT IF AN END-OF-CAR BULKHEAD, AS DETAILED ON PAGE 76 IS USED, THE END-WALL LINING IS NOT REQUIRED.
- 2 ANTI-SWAY BRACE (5 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN THE LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO STRAPPING BOARDS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 75.
- 4 SEPARATOR GATE, 3/8" PLYWOOD, 4' X 8' SHEET (2 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED 2 W/1-6d NAIL EACH.
- 5 BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 59 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.
- 6 STRAPPING BOARD (2 REQD). SEE THE DETAIL ON PAGE 59.
- 7 BUNDLING STRAP, 1-1/4" X .031" OR .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 6. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED 5.
- 8 SEPARATOR GATE, 3/8" PLYWOOD, 4' X 4' SHEET (2 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED 2 W/1-6d NAIL EACH.
- 9 BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 59. SEE SPECIAL NOTE 3 AT LEFT.
- 10 SEAL FOR 1-1/4" STRAPPING (14 REQD, 4 PER BULKHEAD STRAP, PIECE MARKED 5 AND 1 PER BUNDLING STRAP, PIECE MARKED 7). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.
- 11 STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

(SPECIAL NOTES CONTINUED)

6. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE BELOW FOR THE LOCATION OF THE HORIZONTAL PIECES IN RELATION TO THE LOCATION OF THE STRAPPING BOARDS. THE STRAPPING BOARDS/HORIZONTAL PIECES SHOULD BE LOCATED WITHIN THESE TOLERANCES, IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.



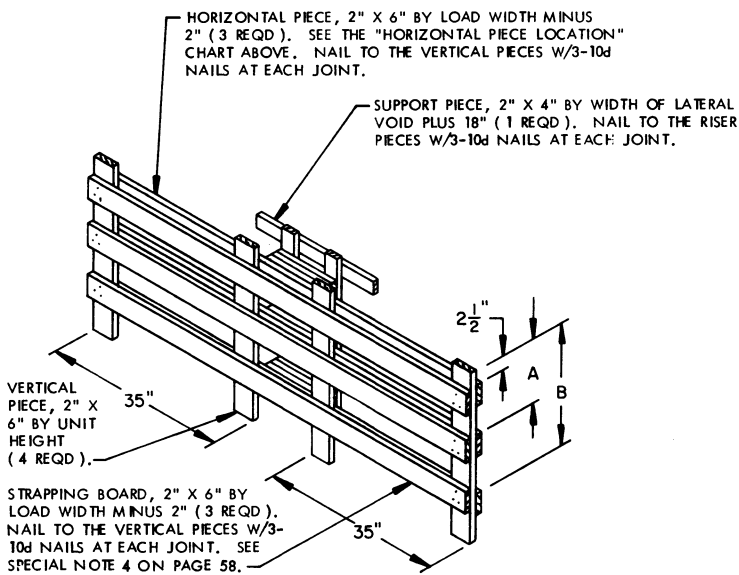
STRAP APPLICATION PLAN VIEW



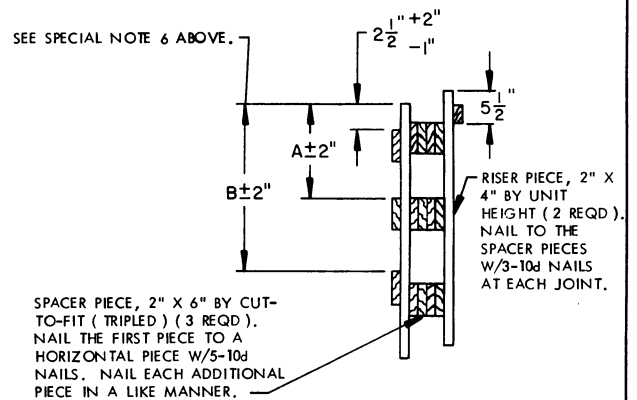
STRAPPING BOARD

RIGHT HAND AND LEFT HAND STRAPPING BOARDS REQUIRED.

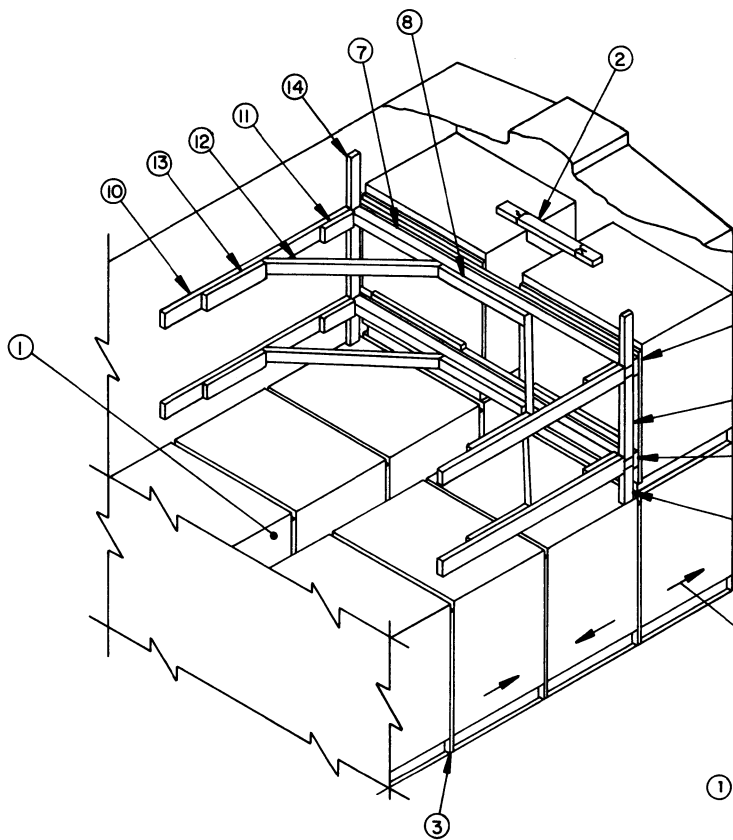
HORIZONTAL PIECE LOCATION		
PALLET UNIT	DIM A	DIM B
6-LAYER	22-1/2" ⁺ 1" ₋ 1"	37-1/2" ⁺ 1" ₋ 1"
5-LAYER	15" ⁺ 1" ₋ 1"	30" ⁺ 1" ₋ 1"
4-LAYER	15" ⁺ 1" ₋ 1"	29" ⁺ 1" ₋ 1"



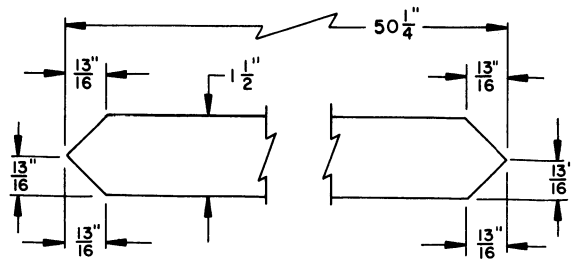
BULKHEAD GATE



END VIEW



ISOMETRIC VIEW



DIAGONAL BRACE

IF THE CAR HAS A BOWED END WALL, A BULKHEAD MUST BE INSTALLED. SEE THE "END-OF-CAR BULKHEAD" DETAIL ON PAGE 76.

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

KEY NUMBERS

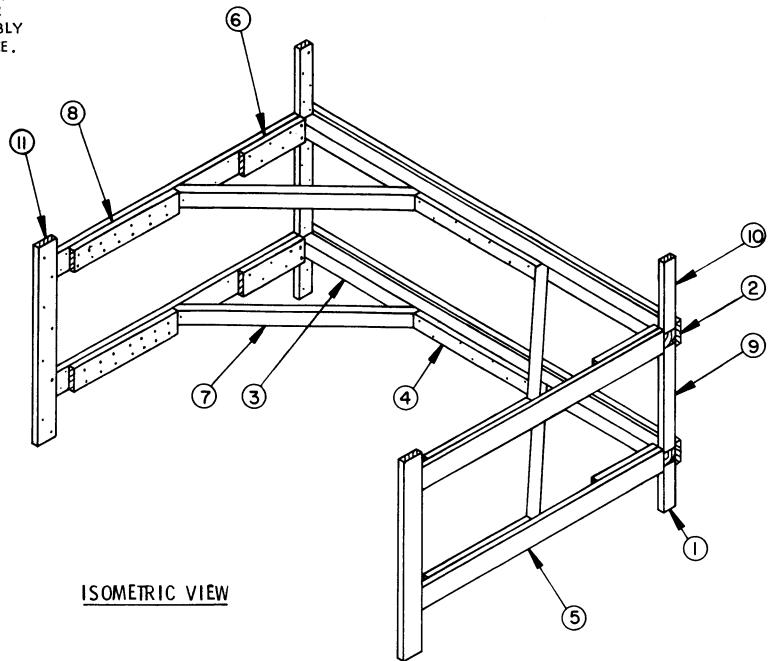
- ① ANTI-SWAY BRACE (AS REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS AS SHOWN IN THE LOAD ON PAGE 6. SEE GENERAL NOTES "N" AND "O" ON PAGE 2. SEE SPECIAL NOTE 3 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 16. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 4' SHEET. POSITION AGAINST THE UNITS NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED ① W/1-6d NAIL EACH.
- ④ PARTIAL LAYER GATE (2 REQD). POSITION THE SUPPORT PIECE TO REST ON THE LOAD BEARING PIECE SHOWN AS PIECE MARKED ⑥. SEE THE "PARTIAL-LAYER GATE" DETAIL ON PAGE 61.
- ⑤ SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ⑥ AND ⑦ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 5 AT LEFT.
- ⑥ LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, W/1-12d NAIL EVERY 6". SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT-TO-FIT) (2 REQD).
- ⑧ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, W/7-16d NAILS. SEE SPECIAL NOTE 6 AT LEFT.
- ⑨ SPACER CLEAT, 2" X 4" X 26" LONG FOR 6-LAYER UNITS, 19" FOR 5-LAYER UNITS AND 11" LONG FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.
- ⑩ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑪ POCKET CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/4-16d NAILS.
- ⑫ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL ABOVE FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑦, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/2-16d NAILS AT EACH END.
- ⑬ BACK-UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑩, W/8-16d NAILS.
- ⑭ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 6-LAYER (BASIC HEIGHT) UNIT. THE DEPICTED PROCEDURES ARE ALSO 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 LENGTHWISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CROSSWISE LOADS. NOTE THAT FOR A CROSSWISE PARTIAL TIER, THE PIECES MARKED ⑥ SHOULD BE LOCATED SO AS TO BEAR AGAINST THE PALLET UNITS IN THE SAME LOCATION AS THE HORIZONTAL PIECES OF A CENTER GATE.
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, BE IT A SECOND TIER, THIRD TIER, OR FIRST. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 61, 62, AND 63 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 ⑤, ⑥, ⑦, ⑨, ⑪, AND ⑭ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑫ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑩ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑩ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑩ IS DOUBLED.
6. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑧, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

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 TEN (10) 4-LAYER UNITS, EIGHT (8) 5-LAYER UNITS, OR SIX (6) 6-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 62 AND 63 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 60 MAY BE USED.
2. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 60 FOR A TYPICAL INSTALLATION OF A K-BRACE.

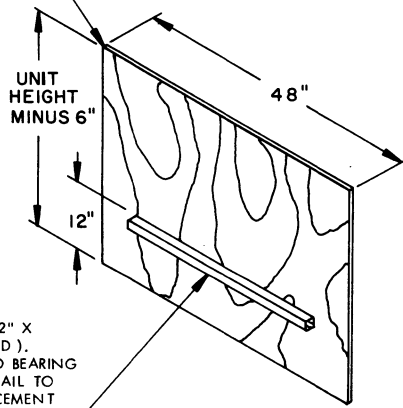


ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 ABOVE.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 ABOVE.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOSNAIL 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 26" LONG FOR 6-LAYER UNITS, 19" LONG FOR 5-LAYER UNITS, AND 11" LONG FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.

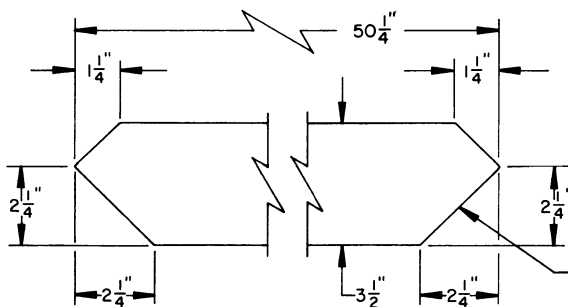
PLYWOOD, 1/2" (1 REQD) CENTER ON AND NAIL TO THE SUPPORT PIECE W/6-4d NAILS.



SUPPORT PIECE, 2" X 2" X 36" (1 REQD). NAIL TO A LOAD BEARING PIECE W/1-10d NAIL TO PREVENT DISPLACEMENT OF GATE.

PARTIAL-LAYER GATE

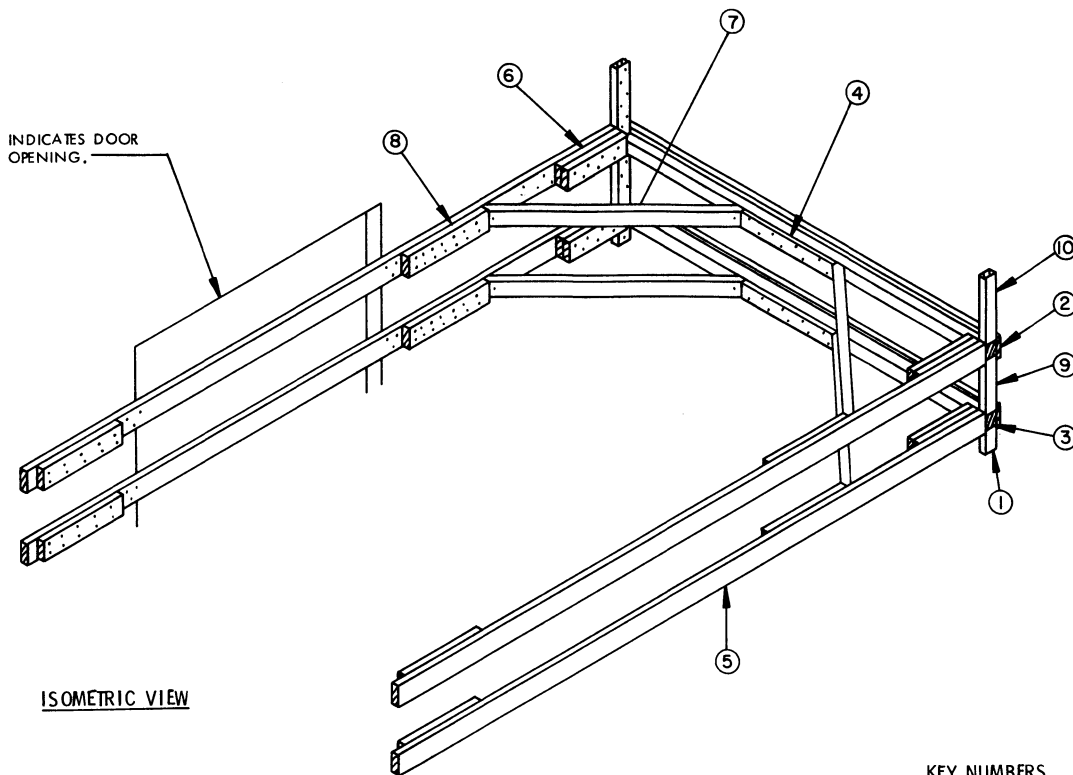
THIS GATE REQUIRED FOR 5-LAYER AND 6-LAYER UNITS ONLY.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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



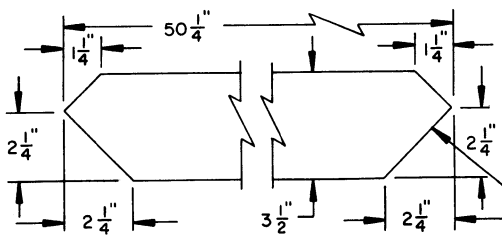
ISOMETRIC VIEW

KEY NUMBERS

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 FOURTEEN (14) 4-LAYER UNITS, ELEVEN (11) 5-LAYER UNITS, OR NINE (9) 6-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 63 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 61 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 60 WILL BE ADEQUATE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ⑥, ⑨, AND ⑩ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED, LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR. THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" ON PAGE 2
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" 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/4-12d 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 PIECES TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤ W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 26" LONG FOR 6-LAYER UNITS, 19" LONG FOR 5-LAYER UNITS, AND 11" LONG FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.
- ⑩ HOLD-DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.



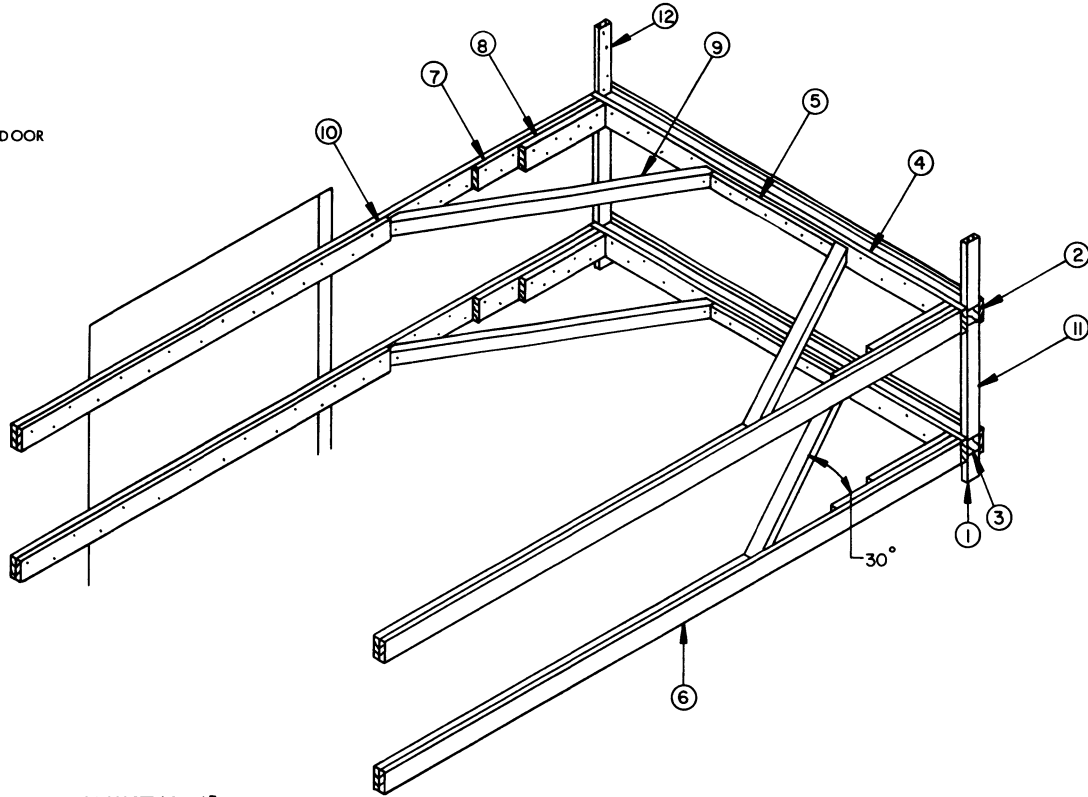
DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "C" K-BRACE

INDICATES DOOR
OPENING.



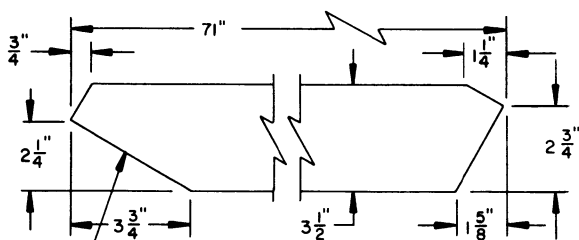
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL NOT BE MORE THAN EIGHTEEN (18) 4-LAYER UNITS, FOURTEEN (14) 5-LAYER UNITS OR TWELVE (12) 6-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 62 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 61 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 60 WILL BE ADEQUATE.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL-LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑦, ⑧, ⑪, AND ⑫, MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑨ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑥ MUST BE DOUBLED. LAMINATE THE SECOND PIECE TO THE FIRST W/40-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 70-1/4" LONG IN LIEU OF 71" LONG WHEN PIECE MARKED ⑥ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑤, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "D" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑥ AND ⑩ THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

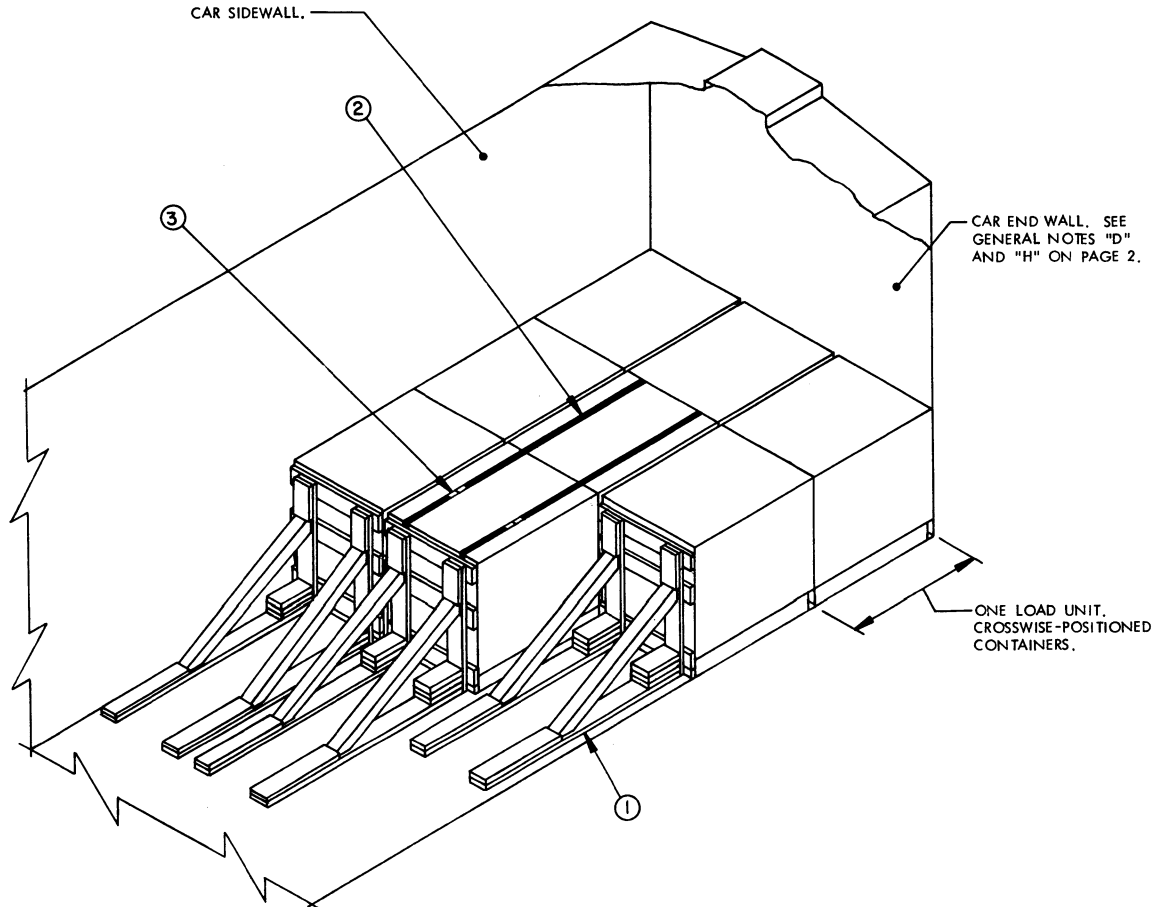
- ① SUPPORT CLEAT, 2" X 4" X 10" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE JOINT BETWEEN THE BOTTOM TWO LAYERS OF CONTAINERS ON THE UNITS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT-TO-FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT-TO-FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT-TO-FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TO NAIL 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 26" LONG FOR 6-LAYER UNITS, 19" LONG FOR 5-LAYER UNITS, AND 11" LONG FOR 4-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/3, 4, OR 5-12d NAILS.
- ⑫ 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 HORIZONTAL WALL CLEAT, PIECE MARKED ⑥. SEE SPECIAL NOTE 2 ABOVE.

TYPE "D" K-BRACE



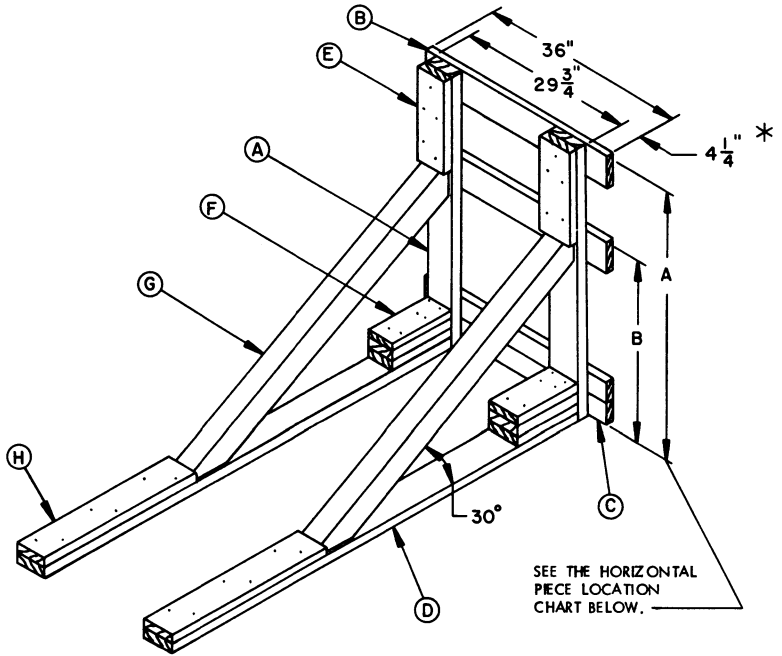
ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2, AND SPECIAL NOTE 5 BELOW.
2. THE PALLET UNIT SHOWN IS THE 5-LAYER UNIT. 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.
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. IF THE CAR TO BE LOADED IS WIDER THAN 9'-2" CRIB FILL, AS SHOWN ON THE APPLICABLE LOAD PAGE, WILL BE REQUIRED: THEN, THE UPPER FILL PIECES, SHOWN AS PIECE MARKED (C), AND THE LOWER HORIZONTAL PIECE SHOWN AS PIECE MARKED (B) WILL BE 39" LONG TO PREVENT DISPLACEMENT OF THE CRIB FILL.
6. HOLD-DOWN CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM FILL PIECE OF A KNEE BRACE ASSEMBLY. THE PROPER MATERIAL SIZE AND PLACEMENT WILL BE AS DEPICTED BY THE "CENTER GATE L" DETAIL ON PAGE 78.

KEY NUMBERS

- (1) KNEE BRACE ASSEMBLY (2 REQD). SEE THE "KNEE BRACE ASSEMBLY A" DETAIL ON PAGE 65 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- (2) BUNDLING STRAP, 1-1/4" X .031" OR .035" X 25'-6" LONG STEEL STRAPPING (2 REQD). PRE-POSITION TO ENCIRCLE THE ODD UNIT, AND THE UNIT ADJACENT TO IT.
- (3) SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "P" ON PAGE 2.



SEE THE HORIZONTAL
PIECE LOCATION
CHART BELOW.

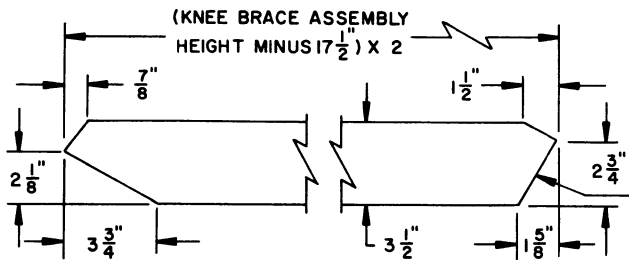
KNEE BRACE ASSEMBLY A

*FOR CROSSWISE-POSITIONED UNITS, RIGHT HAND AND LEFT HAND ASSEMBLIES ARE REQUIRED. POSITION THE 4-1/4" DIMENSION AGAINST THE BASE END OF CONTAINERS.

KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" BY DIMENSION A (2 REQD). SEE THE CHART AT LEFT FOR VERTICAL PIECES OF OTHER LENGTHS.
- (B) HORIZONTAL PIECE, 2" X 6" X 36" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 5 ON PAGE 64.
- (C) FILL PIECE, 2" X 4" X 36" (2 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 6 ON PAGE 64.
- (D) FLOOR CLEAT, 2" X 6" BY LENGTH-TO-SUIT (.87 OR 7/8 TIMES LENGTH OF PIECE MARKED (C), PLUS 30") (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "T" ON PAGE 2.
- (E) HOLD-DOWN CLEAT, 2" X 6" X 16" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- (F) POCKET CLEAT, 2" X 6" X 12" (TRIPLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT, PIECE MARKED (D), W/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.
- (G) BRACE, 4" X 4" BY CUT-TO-FIT (KNEE BRACE ASSEMBLY HEIGHT MINUS 17-1/2" TIMES 2) (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (D), W/2-16d NAILS AT EACH JOINT.
- (H) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (D), W/6-40d NAILS.

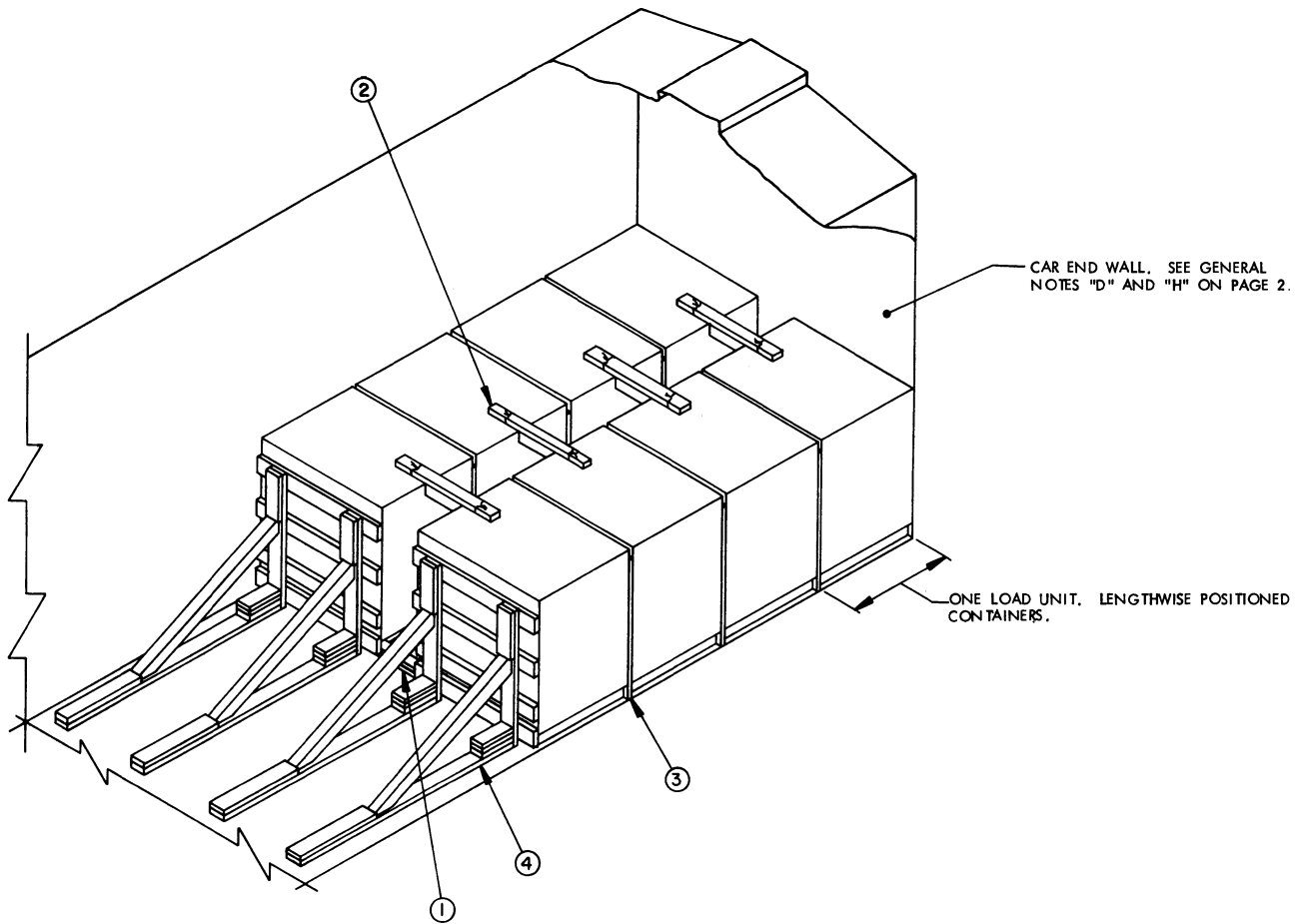
HORIZONTAL PIECE LOCATION		
PALLET UNIT	DIM A	DIM B
6-LAYER	46"	31"
5-LAYER	44"	31"
4-LAYER	36"	23"



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

BRACE
4" X 4" MATERIAL

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



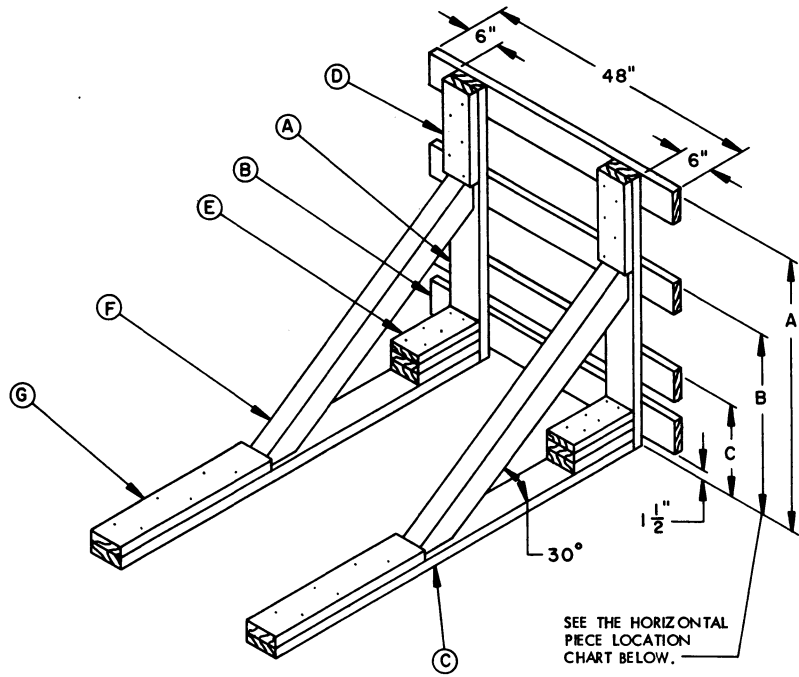
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE PALLET UNIT SHOWN IS THE 6-LAYER (BASIC HEIGHT) UNIT. 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.
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 CLEATS (GATE HOLD DOWN) MUST BE APPLIED TO THE BOTTOM HORIZONTAL PIECE OF A KNEE BRACE ASSEMBLY. THE PROPER MATERIAL SIZE AND PLACEMENT WILL BE AS DEPICTED BY THE "CENTER GATE B" DETAIL ON PAGE 15.

- ① ANTI-SWAY BRACE (4 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 17. INSTALL BETWEEN LATERALLY ADJACENT PALLET UNITS. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (4 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 17. WIRE TIE TO TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 76.
- ③ SEPARATOR GATE, 3/8" PLYWOOD, 4' X 4' SHEET (6 REQD). POSITION AGAINST THE UNITS. NAIL TO THE ADJACENT CROSS BRACE OF THE ANTI-SWAY BRACES MARKED ① W/1-6d NAIL EACH.
- ④ KNEE BRACE ASSEMBLY (2 REQD). SEE THE "KNEE BRACE ASSEMBLY B" DETAIL ON PAGE 67 FOR CONSTRUCTION GUIDANCE, AND NAILING REQUIREMENTS.



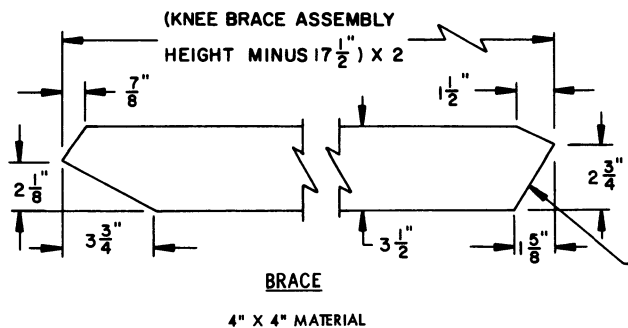
SEE THE HORIZONTAL
PIECE LOCATION
CHART BELOW.

KNEE BRACE ASSEMBLY B

KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" BY DIMENSION A (2 REQD). SEE THE CHART AT LEFT FOR VERTICAL PIECES OF OTHER LENGTHS.
- (B) HORIZONTAL PIECE, 2" X 6" X 48" (AS REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTES "N" AND "O" ON PAGE 2, AND SPECIAL NOTE 5 ON PAGE 66.
- (C) FLOOR CLEAT, 2" X 6" BY LENGTH TO SUIT (.87 OR 7/8 TIMES LENGTH OF PIECE MARKED (E), PLUS 30") (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "T" ON PAGE 2.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 16" (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" BY CUT-TO-FIT (KNEE BRACE ASSEMBLY HEIGHT MINUS 17-1/2", TIMES 2) (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH JOINT.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT (NOT SHOWN). SEE SPECIAL NOTE 5 ON PAGE 66.

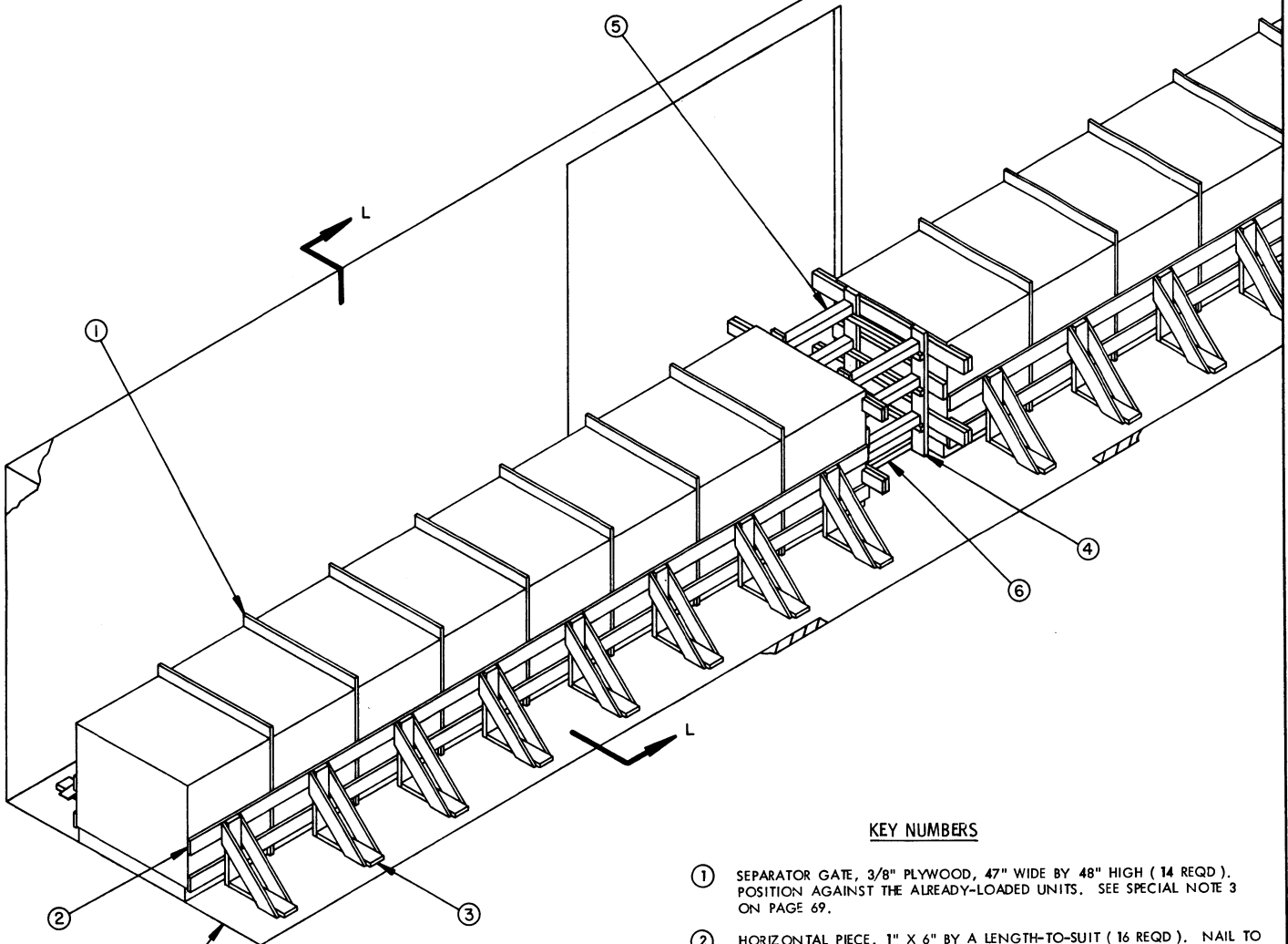
HORIZONTAL PIECE LOCATION			
PALLET UNIT	DIM A	DIM B	DIM C
6-LAYER	46"	31"	16"
5-LAYER	44"	31"	16"
4-LAYER	36"	23"	---



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

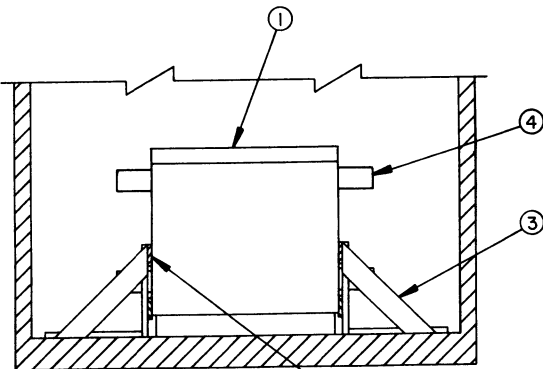
CENTER GATE N

DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	49"	48"	39"
B	46"	44"	36"



ISOMETRIC VIEW

SEE GENERAL NOTE "H" ON PAGE 2.



SECTION L-L

KEY NUMBERS

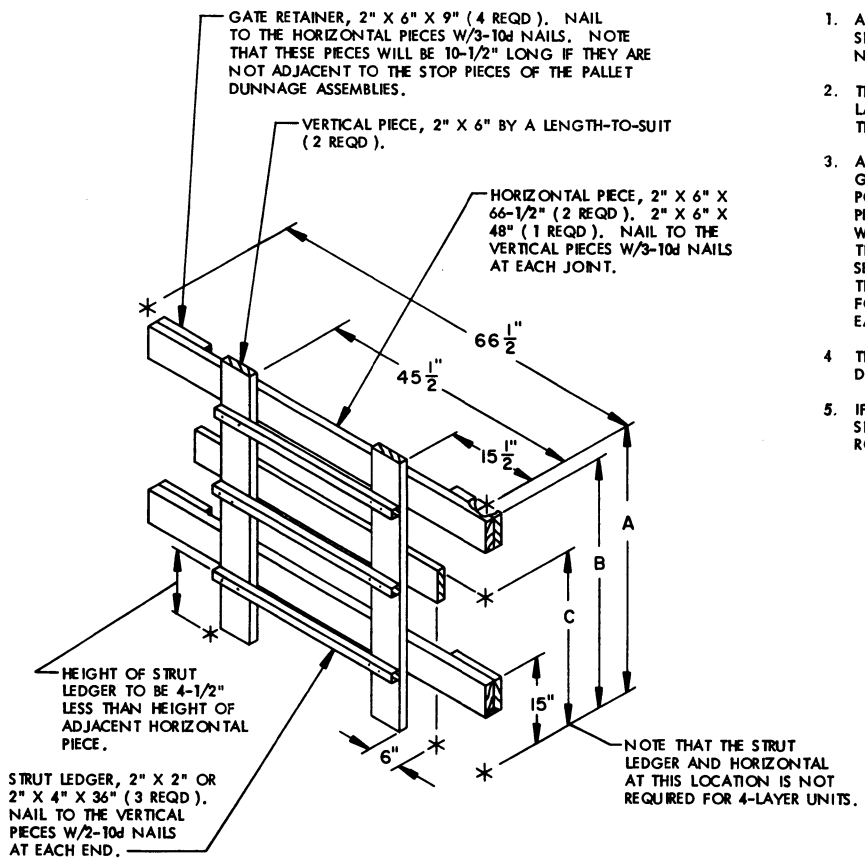
- ① SEPARATOR GATE, 3/8" PLYWOOD, 47" WIDE BY 48" HIGH (14 REQD). POSITION AGAINST THE ALREADY-LOADED UNITS. SEE SPECIAL NOTE 3 ON PAGE 69.
- ② HORIZONTAL PIECE, 1" X 6" BY A LENGTH-TO-SUIT (16 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE "LCL BRACE" DETAIL ON PAGE 70 FOR HEIGHT LOCATION GUIDANCE. SEE GENERAL NOTES "N" AND "O" ON PAGE 2.
- ③ LCL BRACE (32 REQD). SEE THE DETAIL ON PAGE 70 AND SPECIAL NOTE 3 ON PAGE 69. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "T" ON PAGE 2.
- ④ CENTER GATE (2 REQD). SEE THE "CENTER GATE M" OR THE "CENTER GATE N" DETAIL ON PAGE 69 FOR LENGTHWISE OR CROSSWISE UNITS, RESPECTIVELY.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (REF: 18") (6 REQD FOR 5 OR 6-LAYER UNITS, 4 REQD FOR 4-LAYER UNITS POSITIONED LENGTHWISE, 4 REQD FOR CROSSWISE). TO NAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "V" AND "W" ON PAGE 3.
- ⑥ GATE HOLD-DOWN, 2" X 3" BY LENGTH OF CENTER VOID PLUS 24". NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 69.

CENTER GATE M

DIM	6-LAYER UNIT	5-LAYER UNIT	4-LAYER UNIT
A	49"	46"	34"
B	46"	43"	31"
C	31"	30"	---

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 PALLET UNIT SHOWN IN THE TYPICAL 1-WIDE LOAD IS THE 5-LAYER UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A 1-WIDE LENGTHWISE LOAD IS SHOWN AS TYPICAL. A CHART IS GIVEN TO SPECIFY THE PROPER DIMENSIONS FOR THE LENGTH AND POSITIONING OF PIECES FOR THE CENTER GATES. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR 1-WIDE CROSSWISE LOADS FOR WHICH THERE IS ALSO A CHART WHICH SPECIFIES LENGTHS AND POSITIONING OF PIECES FOR THE CENTER GATES. NOTE THAT THE SEPARATOR GATES, PIECES MARKED (1), ARE NOT REQUIRED, AND THE QUANTITY OF LCL BRACES, PIECES MARKED (3), IS NOT CORRECT FOR CROSSWISE LOADS. ONE (1) LCL BRACE WILL BE CENTERED AT EACH SIDE OF EACH PALLET UNIT.
4. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.
5. IF DESIRED, GATE HOLD-DOWN WITH ASSOCIATED FILL PIECES, AS SHOWN ELSEWHERE ON THE APPLICABLE CENTER GATE FOR A SINGLE ROW, MAY BE USED IN LIEU OF PIECE MARKED (6).

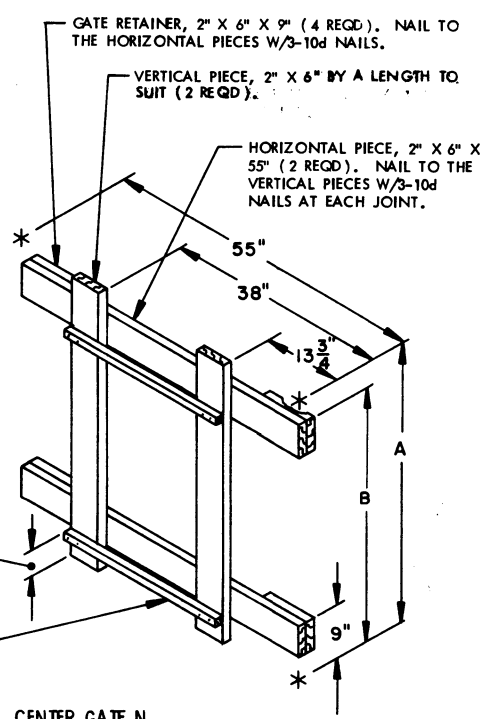


CENTER GATE M

THIS GATE IS FOR USE WITH LENGTHWISE UNITS. REFER TO THE "CENTER GATE M" CHART ON PAGE 68 FOR FIGURES REPRESENTED BY LETTERS ON THE ABOVE DETAIL. SEE SPECIAL NOTE 5 ABOVE.

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

STRUT LEDGER, 2" X 2" OR 2" X 4" X 30" (2 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



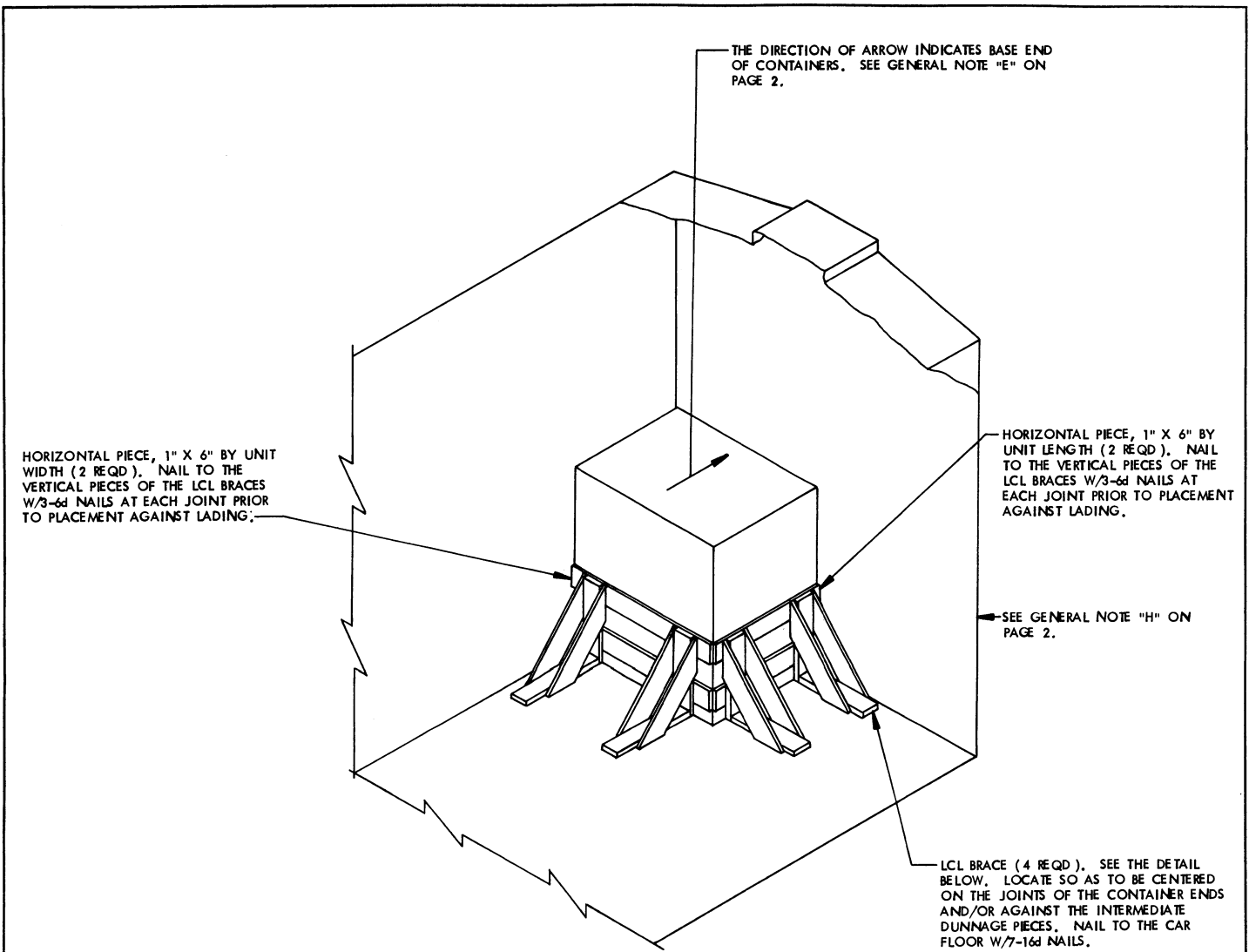
CENTER GATE N

THIS GATE IS FOR USE WITH CROSSWISE UNITS. REFER TO THE "CENTER GATE N" CHART AT TOP OF PAGE 68 FOR FIGURES REPRESENTED BY LETTERS ON THE DETAIL ABOVE. POSITION CENTER GATE WITH THE 13-3/4" DIMENSION AGAINST THE BASE END OF CONTAINERS. RIGHT HAND AND LEFT HAND GATES ARE REQUIRED.

BILL OF MATERIAL (TYPICAL)		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	422	211
2" X 2"	18	6
2" X 3"	6	3
2" X 6"	180	180
4" X 4"	9	12
NAILS	NO. REQD	POUNDS
6d (2")	192	1-1/4
8d (2-1/2")	384	4
10d (3")	192	3
16d (3-1/2")	312	6-3/4
PLYWOOD, 3/8" (7 SHEETS)	224 SQ FT REQD	231 LBS

LOAD AS SHOWN (TYPICAL)

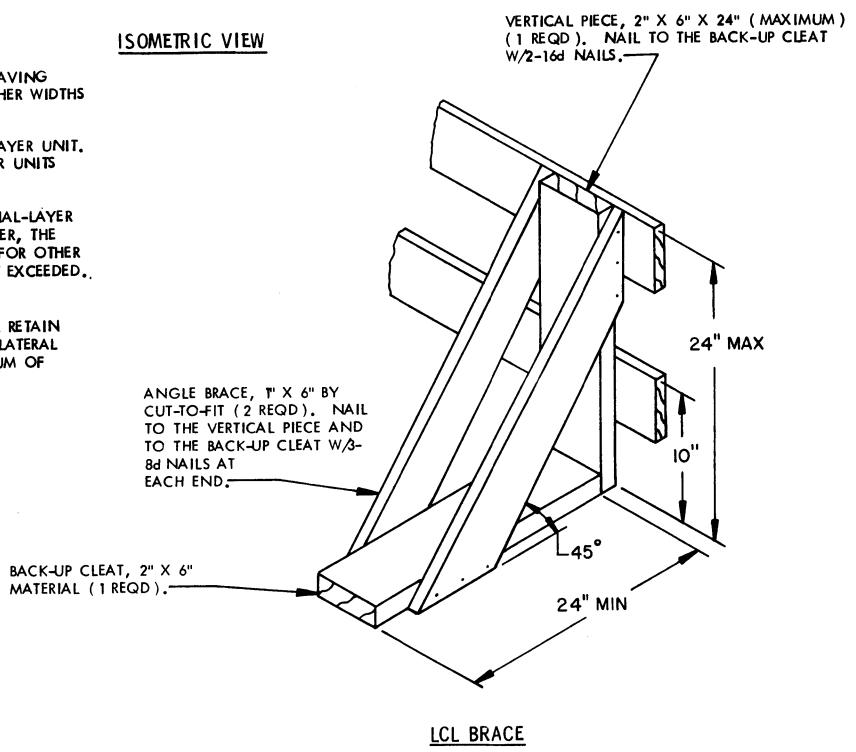
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	16	27,152 LBS
DUNNAGE		1,063 LBS
TOTAL WEIGHT		28,215 LBS (APPROX)



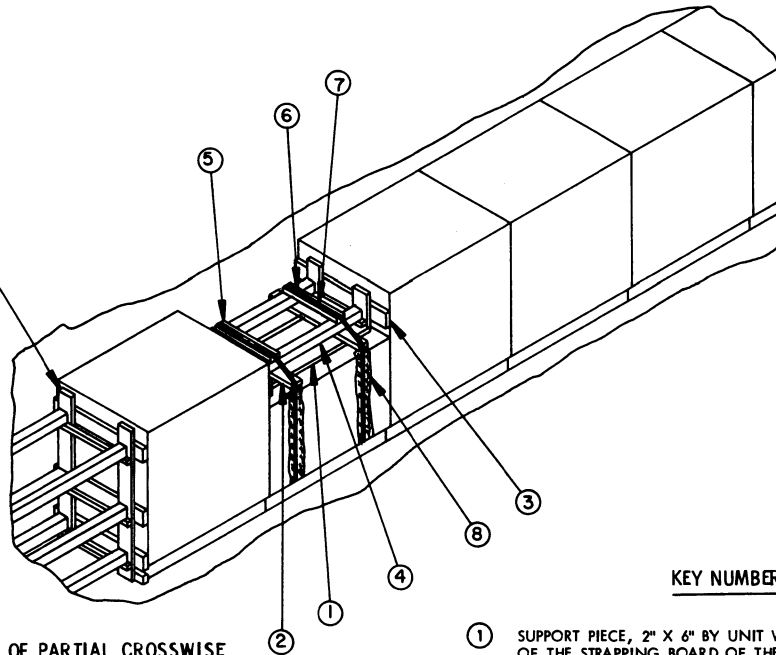
SPECIAL NOTES:

1. AN 8'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTES "D" AND "I" ON PAGE 2.
2. THE PALLET UNIT SHOWN IN THE TYPICAL LCL LOAD IS THE 6-LAYER UNIT. 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 LENGTHWISE UNIT IS SHOWN, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE 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.

ISOMETRIC VIEW



INDICATES A TYPICAL CENTER GATE.



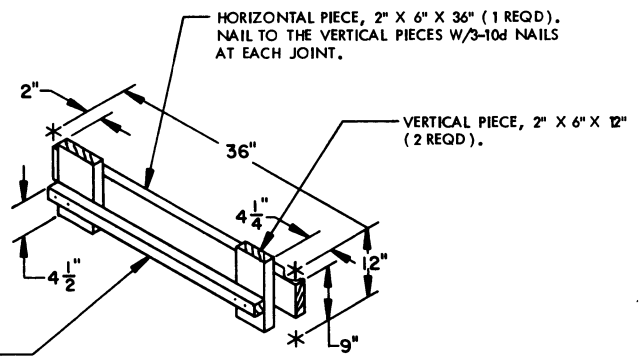
POSITIONING OF PARTIAL CROSSWISE UNIT WITHIN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CROSSWISE LOAD.
2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE 6-LAYER (BASIC HEIGHT) 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 ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 4-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A, 13-20PM 1001, 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 CROSSWISE UNIT IN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
7. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS, THE PROCEDURES SHOWN ON PAGE 74 MAY BE MORE ECONOMICAL.
8. THE PARTIAL-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH BUT NOT IN THE DOORWAY. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

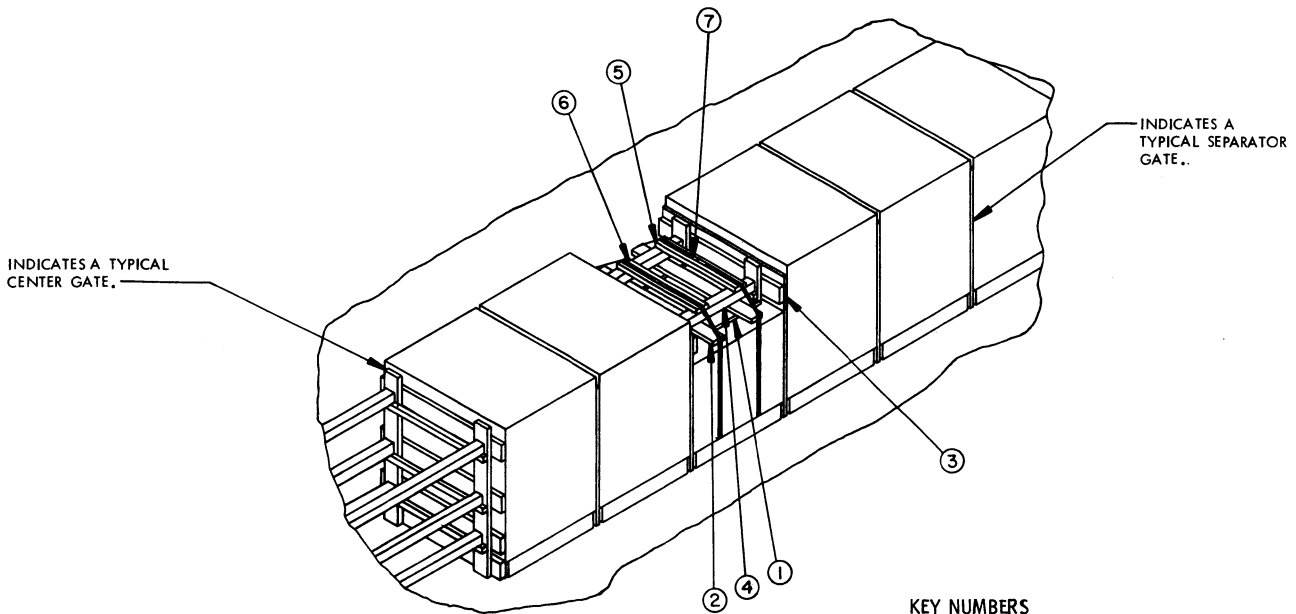
KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" BY UNIT WIDTH (2 REQD). POSITION ON TOP OF THE STRAPPING BOARD OF THE TOP DUNNAGE ASSEMBLY.
- ② RETAINER PIECE, 2" X 4" X 36" (2 REQD). NAIL TO THE SUPPORT PIECES, PIECES MARKED ①, W/2-10d NAILS AT EACH JOINT.
- ③ PARTIAL-UNIT GATE (2 REQD, ONE RIGHT HAND AND ONE LEFT HAND). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ④ STRUT, 4" X 4" X 42" (2 REQD). TOENAIL TO THE PARTIAL-UNIT GATE, PIECE MARKED ③, W/2-16d NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑦ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "P" ON PAGE 2.
- ⑧ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.



PARTIAL-UNIT GATE

POSITION THE 4-1/4" DIMENSION AGAINST THE BASE END OF THE CONTAINERS.



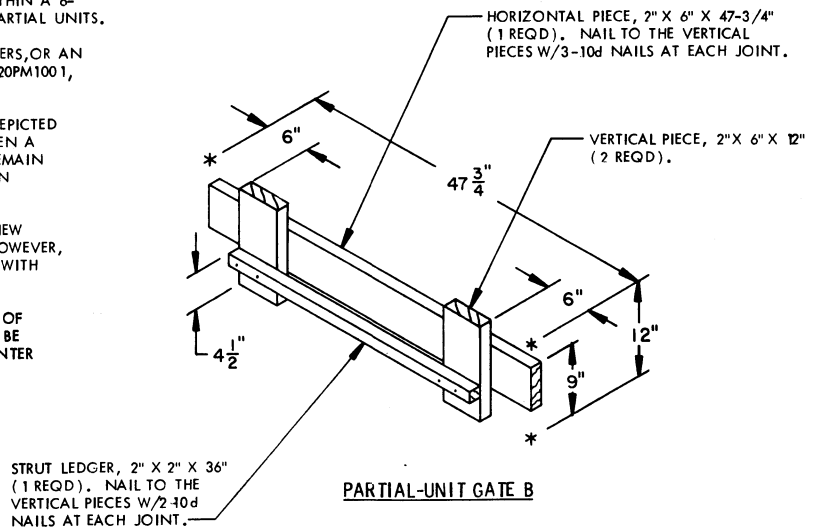
POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE, HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LENGTHWISE CONTAINER LOAD.
2. THE PALLET UNIT SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW IS THE 6-LAYER (BASIC HEIGHT) UNIT. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.
3. A LESS-THAN-FULL HEIGHT PALLET UNIT OF LENGTHWISE-POSITIONED PROPELLING CHARGES WHICH IS TO BE SHIPPED WITHIN A LAYER OF A LOAD HAS NO LIMITATIONS AS TO THE NUMBER OF LAYERS OF CONTAINERS ON THE PARTIAL UNIT. THE DEPICTED PROCEDURES SHOW THE BRACING OF A 4-LAYER UNIT WITHIN A 6-LAYER LOAD. THE PRINCIPLES CAN BE ADAPTED TO SUIT OTHER SIZE PARTIAL UNITS.
4. A PARTIAL UNIT MUST CONSIST OF FULL LAYERS OF SIX (6) CONTAINERS, OR AN APPROVED FILLER ASSEMBLY, AS DETAILED BY DRAWING 19-48-4042A/13-20PM1001, 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 FUTURE SHIPMENT.
6. THE "POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
7. THE PARTIAL-UNIT PROCEDURES SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH BUT NOT IN THE DOORWAY. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE PARTIAL UNIT AND A CENTER GATE.

KEY NUMBERS

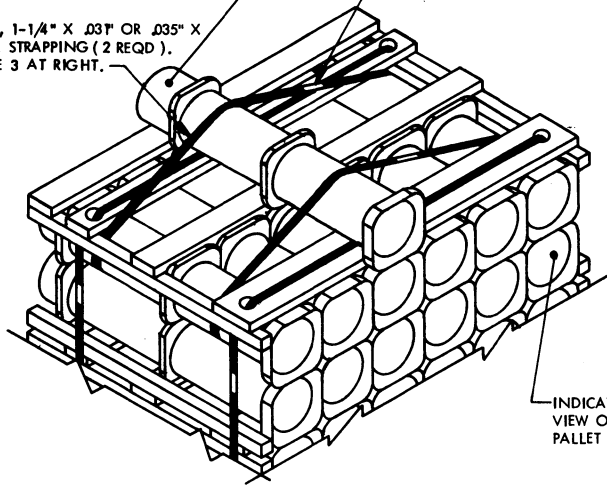
- ① SUPPORT PIECE, 2" X 6" X 36" (2 REQD). POSITION UNDER THE VERTICAL PIECES OF PIECE MARKED ③.
- ② RETAINER PIECE, 2" X 4" X 47-3/4" (2 REQD). NAIL TO THE SUPPORT PIECES, PIECE MARKED ①, W/2-10d NAILS AT EACH JOINT.
- ③ PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTES "N" AND "O" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ④ STRUT, 4" X 4" X 30" (2 REQD). TOENAIL TO THE PARTIAL-UNIT GATE, PIECE MARKED ③, W/2-16d NAILS AT EACH END.
- ⑤ STRAPPING BOARD, 2" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ④, W/3-10d NAILS AT EACH JOINT.
- ⑥ UNITIZING STRAP, 1-1/4" X .035" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑦ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "P" ON PAGE 2.



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

POSITION CONTAINER DIRECTLY ABOVE A CONTAINER IN THE PALLET UNIT.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 9'-6" LONG STEEL STRAPPING (2 REQD). SEE SPECIAL NOTE 3 AT RIGHT.



INDICATES PARTIAL VIEW OF A FULL PALLET UNIT.

SECUREMENT OF ONE CONTAINER

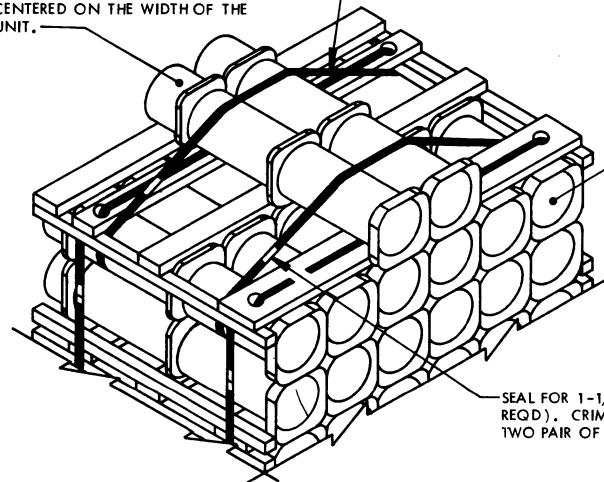
SPECIAL NOTES:

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. LEFTOVER CONTAINERS ARE DESCRIBED AS A QUANTITY OF CONTAINERS WHICH IS INSUFFICIENT TO FORM A FULL-LAYERED PARTIAL UNIT FOR SHIPMENT EITHER ON TOP OF A LOAD AS SHOWN ON PAGE 74 OR WITHIN A LAYER AS SHOWN ON PAGES 71 AND 72.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNITS, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE UNITIZING STRAPS MUST NOT GO AROUND THE INTERMEDIATE OR TOP DUNNAGE ASSEMBLY. THE STRAP MUST BE THREADED BEHIND THE 2" X 2" PIECES OF THE ASSEMBLIES.
4. OBVIOUSLY, A PALLET UNIT WITH ONE OR MORE CONTAINERS STRAPPED TO THE TOP MUST BE POSITIONED IN THE TOP LAYER OF A LOAD. THE PREFERRED LOCATION SHOULD BE NEAR THE CENTER AREA OF A CAR IF A FULL LOAD IS BEING SHIPPED.
5. THE PROCEDURES ON THIS PAGE ARE APPLICABLE FOR THE SHIPMENT OF LEFTOVER CONTAINERS IN ANY OF THE LOADS DEPICTED HEREIN.

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 10'-0" LONG STEEL STRAPPING (2 REQD). SEE SPECIAL NOTE 3 ABOVE.

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

INDICATES PARTIAL VIEW OF A FULL PALLET UNIT.



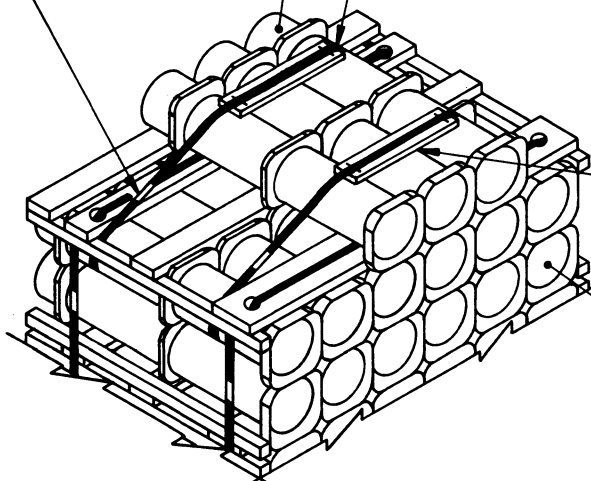
SEAL FOR 1-1/4" STRAPS (2 REQD). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES.

SECUREMENT OF TWO CONTAINERS

UNITIZING STRAP, 1-1/4" X .031" OR .035" X 10'-6" LONG STEEL STRAPPING (2 REQD). SEE SPECIAL NOTE 3 ABOVE.

POSITION CONTAINERS DIRECTLY ABOVE CONTAINERS IN THE PALLET UNIT.

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



STRAPPING BOARD, 1" X 4" X 15" (2 REQD). INCREASE THE LENGTH BY 7-1/2" FOR EACH ADDITIONAL CONTAINER.

INDICATES PARTIAL VIEW OF A FULL PALLET UNIT.

SECUREMENT OF THREE CONTAINERS

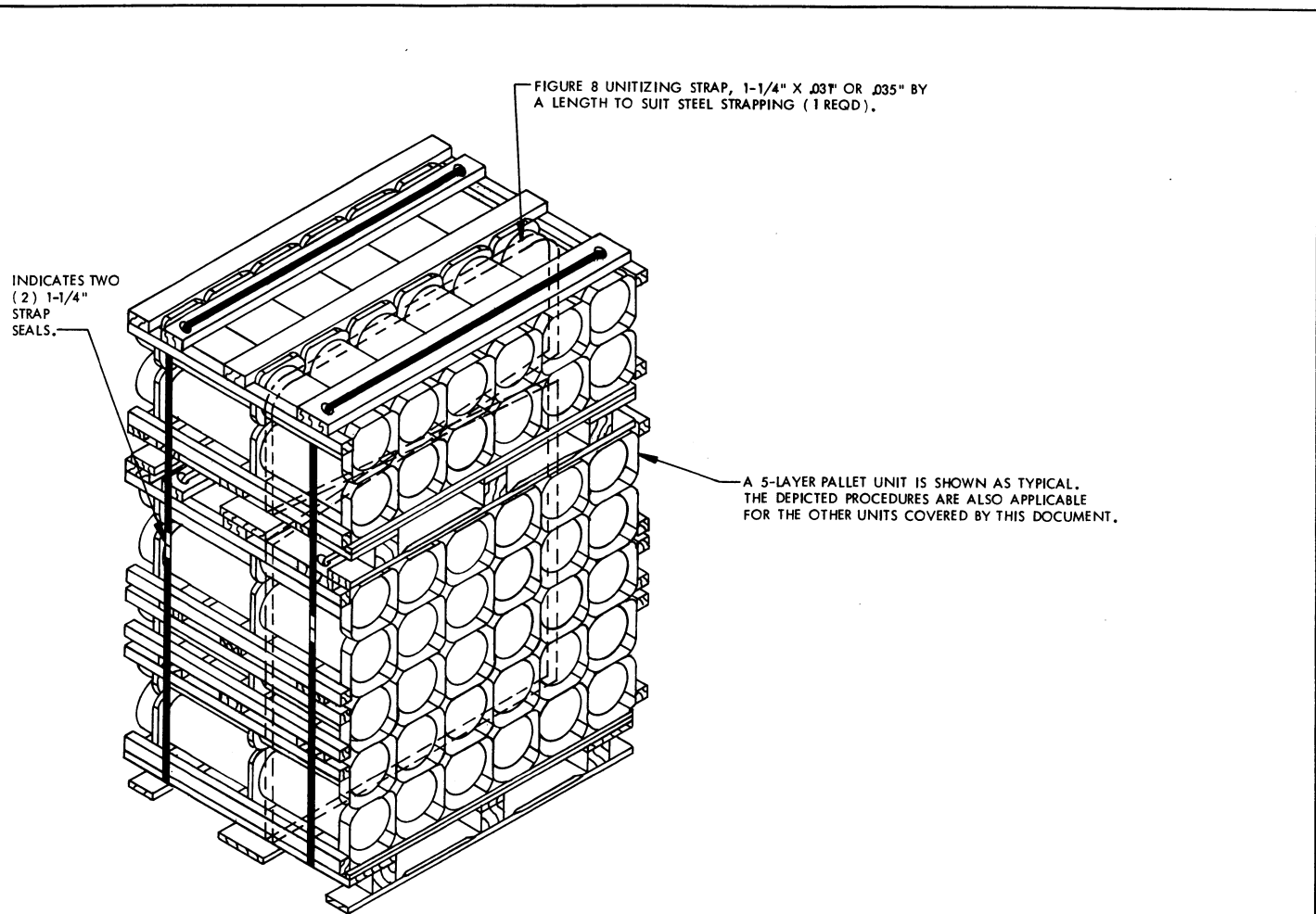


FIGURE 8 UNITIZING STRAP, 1-1/4" X .03" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (1 REQD).

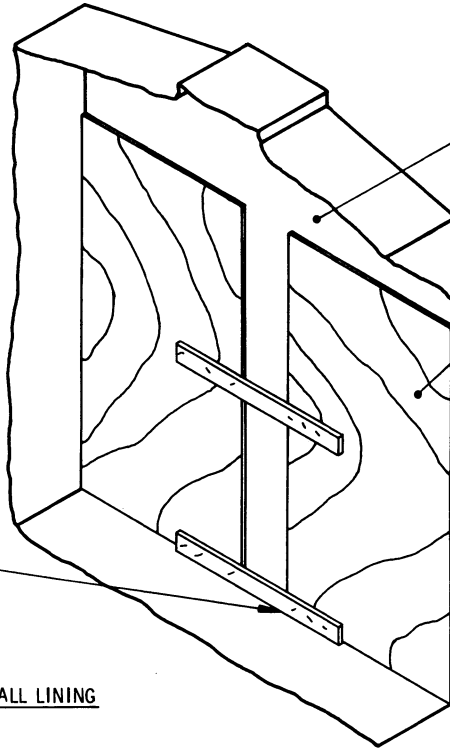
INDICATES TWO (2) 1-1/4" STRAP SEALS.

A 5-LAYER PALLET UNIT IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE OTHER UNITS COVERED BY THIS DOCUMENT.

SECUREMENT OF A 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 OF MORE THAN TWO LAYERS OF CONTAINERS, OR AN ALTERNATIVE METHOD FOR ONE OR TWO LAYERS, REFER TO THE PROCEDURES ON PAGE 71.

1/2" PLYWOOD TIE PIECE, 4" X 48" (2 REQD), LOCATE SO AS TO BE UNDER THE "OVERHANG" OF THE PALLET UNITS. NAIL TO EACH PLYWOOD SHEET W/3 APPLICABLY SIZED NAILS AND CLINCH.



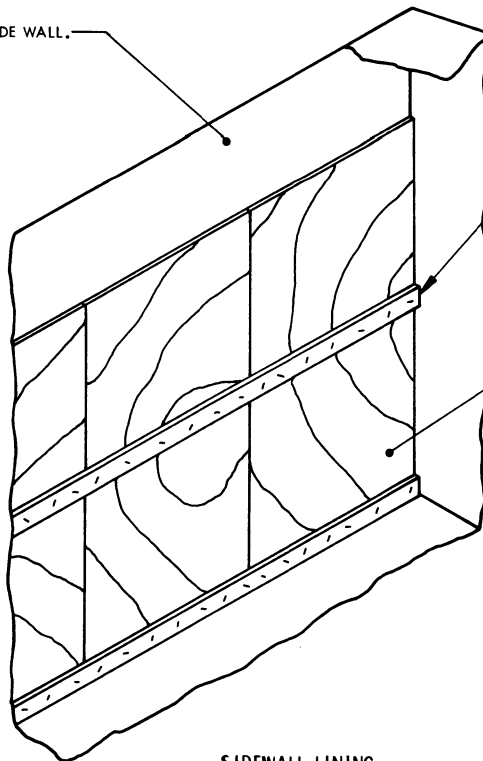
CAR END WALL.

1/2" MINIMUM THICK PLYWOOD, 4' X 8' SHEET. NOTE THAT 3/8" PLYWOOD MAY BE USED IN LIEU OF 1/2" WHEN THIS ASSEMBLY IS USED AS AN ALTERNATIVE SEPARATOR GATE.

END WALL LINING

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

CAR SIDE WALL.



1/2" PLYWOOD TIE PIECE, 4" WIDE BY RANDOM LENGTH. LOCATE SO AS TO BE UNDER THE "OVERHANG" OF THE PALLET UNITS. NOTE THAT THE UPPER TIE PIECE MAY BE POSITIONED ABOVE THE TOP OF THE 5-LAYER PALLET UNITS.

1/4" MINIMUM PLYWOOD, 1/8" MINIMUM HARDBOARD OR .060" MINIMUM THICK SOLID WALL FIBERBOARD. NAIL PLYWOOD OR HARDBOARD TO PLYWOOD TIE PIECE W/1 APPLICABLY SIZED NAIL EVERY 8". STAPLE FIBERBOARD TO PLYWOOD TIE PIECE W/1 STAPLE EVERY 6".

SIDEWALL LINING

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

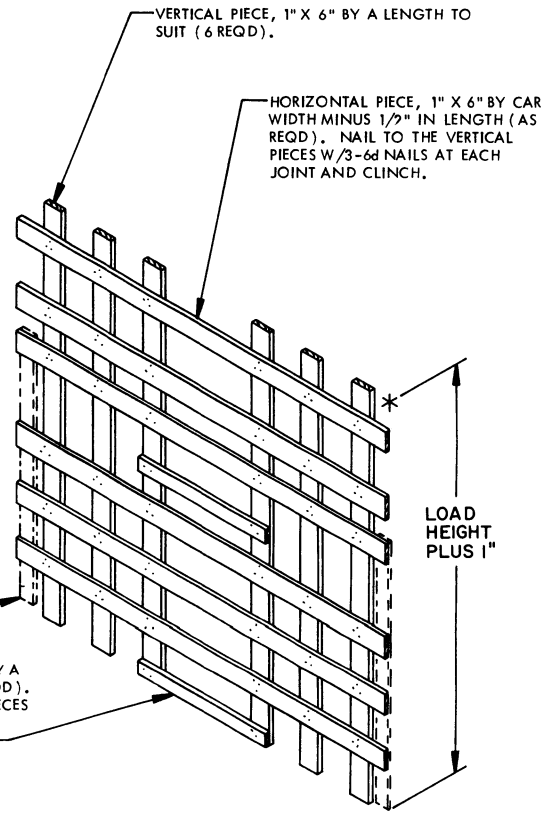
DETAILS

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 AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "A", AS DETAILED ON PAGE 14, IS SHOWN AS TYPICAL.

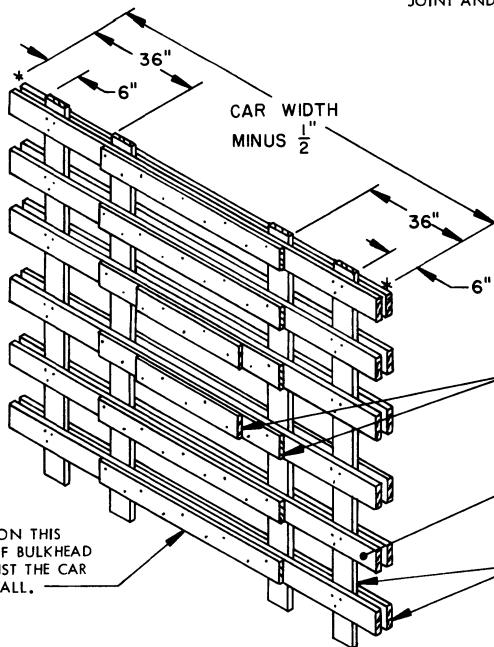
NOTE ▲ :

THE "ALTERNATIVE SEPARATOR GATE" IS SHOWN AS TYPICAL ONLY. REFER TO THE "CENTER GATE" DETAIL ON PAGE 14, 26, OR 38 FOR THE QUANTITY AND HEIGHT LOCATION OF HORIZONTAL PIECES, AND FOR PLACEMENT OF THE VERTICAL PIECES. NOTE THAT THE STOP PIECES, SHOWN BY DOTTED LINES ON THE DETAIL AT RIGHT, ARE ONLY REQUIRED FOR SEPARATOR GATES WHICH ARE POSITIONED IN THE DOORWAY AREA OF CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS, WHEN THE NAILED SIDE BLOCKING/DOORWAY PROTECTION STRAP TYPE DOORWAY PROTECTION IS USED, OR IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES.



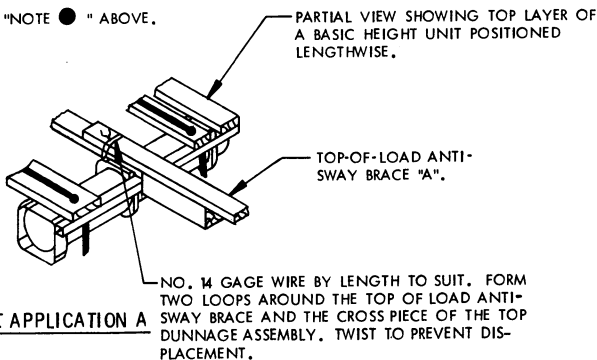
ALTERNATIVE SEPARATOR GATE

SEE "NOTE ▲" AT LEFT ABOVE.

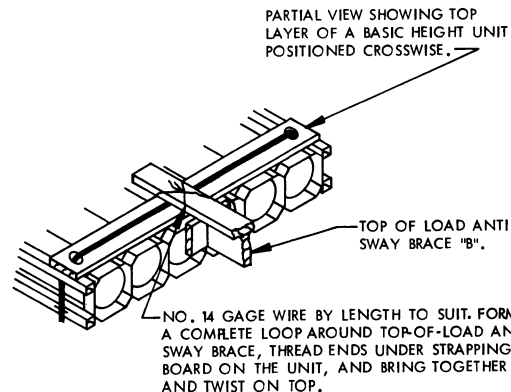


END OF CAR BULKHEAD

SEE "NOTE ●" ABOVE.

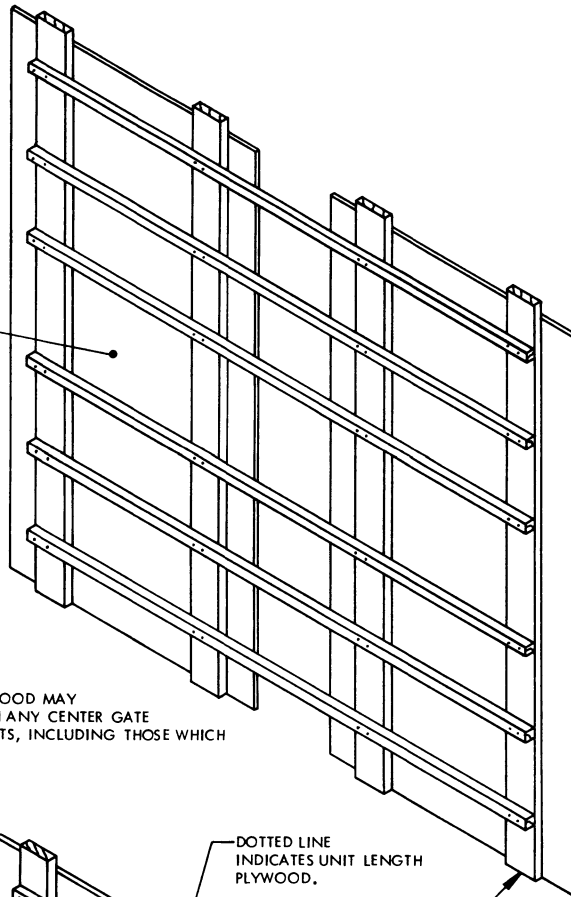


TYPICAL WIRE APPLICATION A



TYPICAL WIRE APPLICATION B

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



PLYWOOD CENTER GATE ALTERNATIVE A

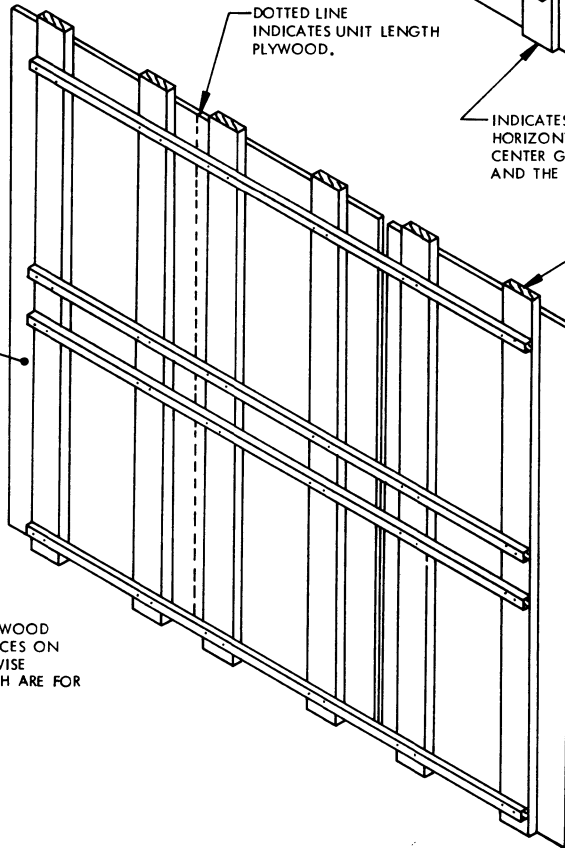
CENTER GATE "A" IS SHOWN AS TYPICAL. PLYWOOD MAY BE USED IN LIEU OF THE HORIZONTAL PIECES ON ANY CENTER GATE CONSTRUCTED FOR LENGTHWISE POSITIONED UNITS, INCLUDING THOSE WHICH ARE FOR THE BRACING OF A SINGLE ROW.

SEE VIEW A.

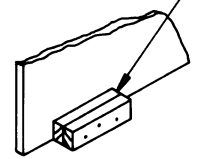
DOTTED LINE INDICATES UNIT LENGTH PLYWOOD.

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.

PLYWOOD, 1/2" THICK BY THE UNIT LENGTH BY THE LOAD HEIGHT OR 8'-0" (3 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".
 NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT LENGTH WHEN THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 8. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH, IF DESIRED.



GATE HOLD DOWN PIECES MUST BE SECURED TO THE PLYWOOD. SEE THE APPLICABLE CENTER GATE DETAIL FOR MATERIAL TO BE USED, AND FOR LOCATION OF HOLD DOWN PIECES.



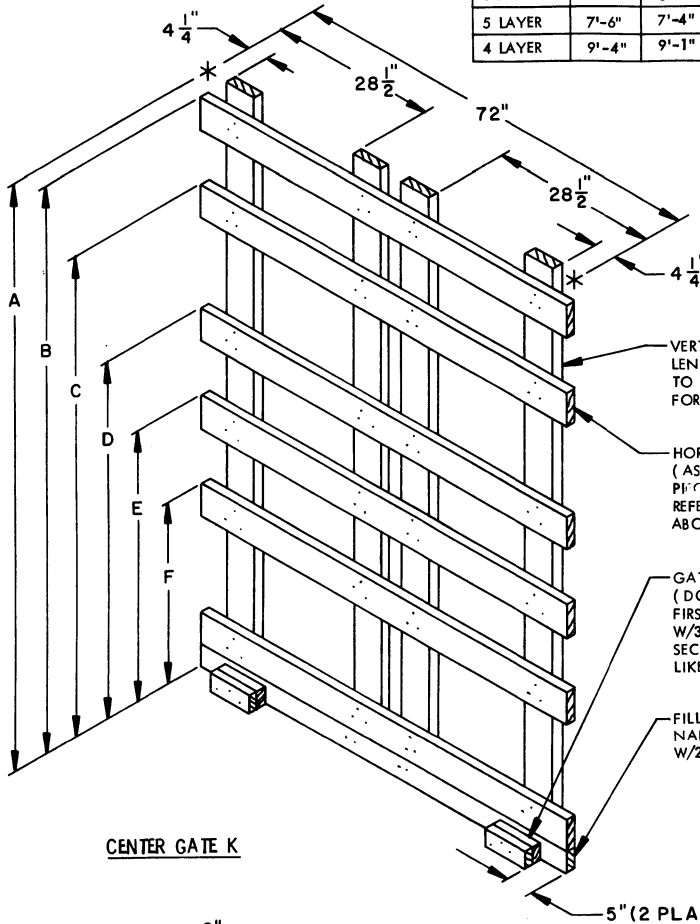
VIEW A

SEE VIEW A.

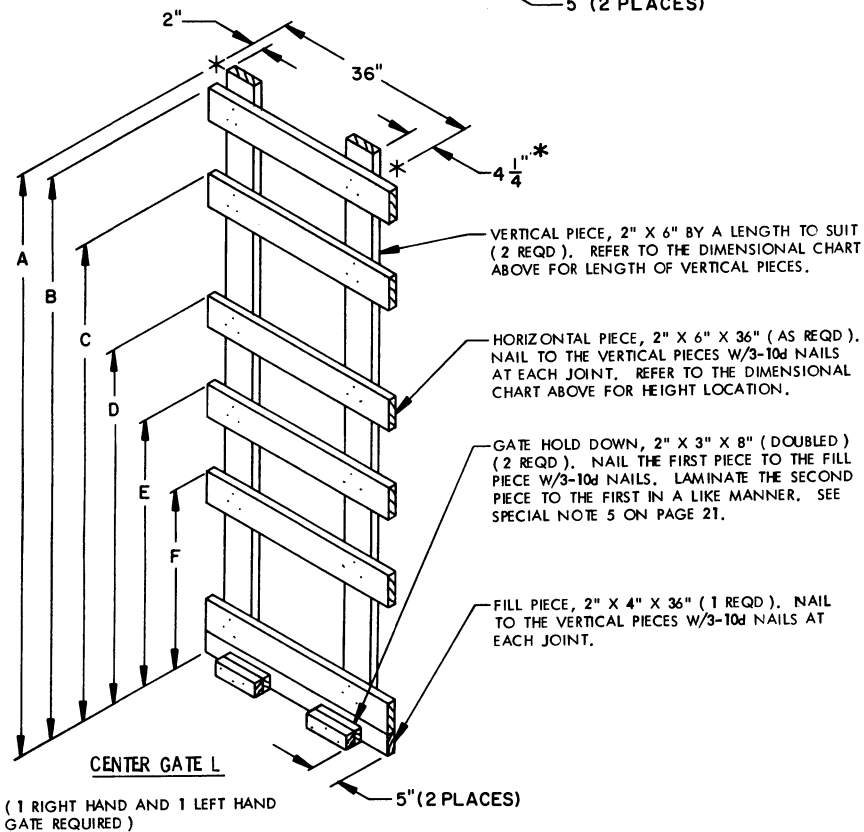
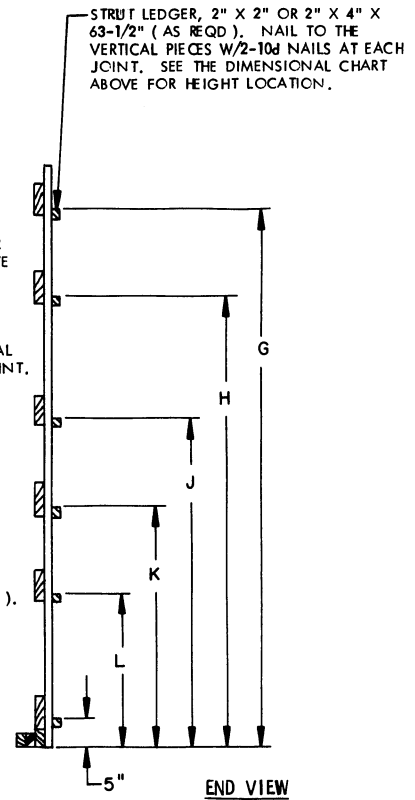
PLYWOOD CENTER GATE ALTERNATIVE B

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

PALLET UNIT	DIMENSIONS										
	A	B	C	D	E	F	G	H	J	K	L
6 LAYER	8'-4"	8'-1"	6'-10"	61"	46"	31"	7'-8-1/2"	6'-5-1/2"	55-1/2"	41-1/2"	26-1/2"
5 LAYER	7'-6"	7'-4"	6'-3"	53"	44"	31"	6'-11-1/2"	7'-0-1/2"	48-1/2"	39-1/2"	26-1/2"
4 LAYER	9'-4"	9'-1"	6'-10"	6'-1"	45"	37"	8'-8-1/2"	6'-5-1/2"	68-1/2"	40-1/2"	32-1/2"

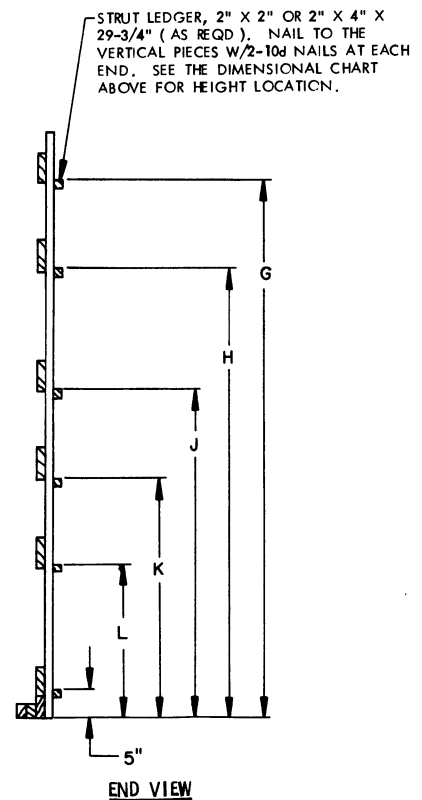


CENTER GATE K



CENTER GATE L

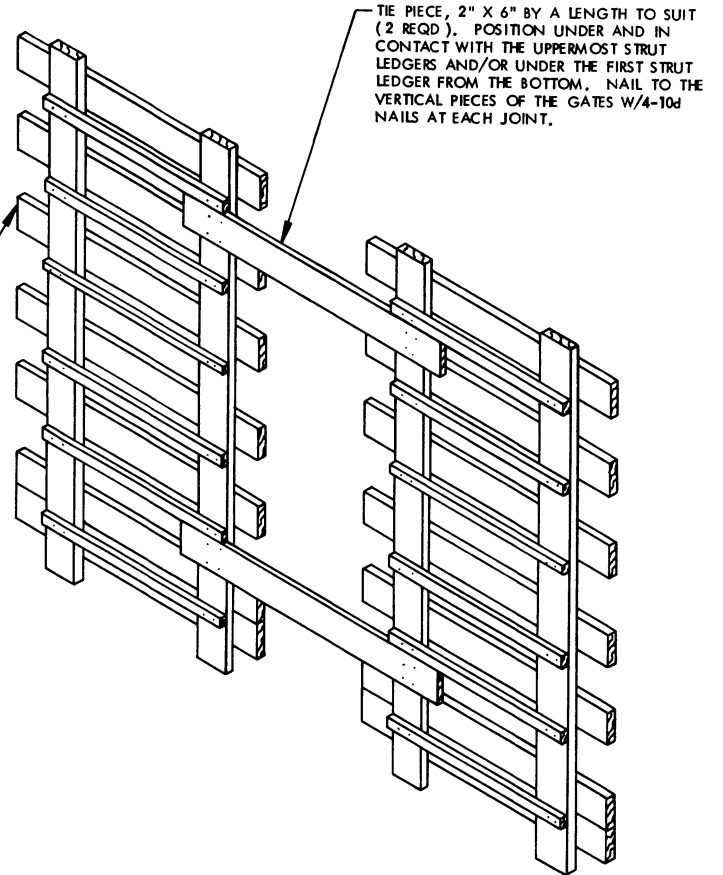
(1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED)



*POSITION THE 4-1/4" DIMENSION AGAINST THE BASE END OF THE CONTAINERS.

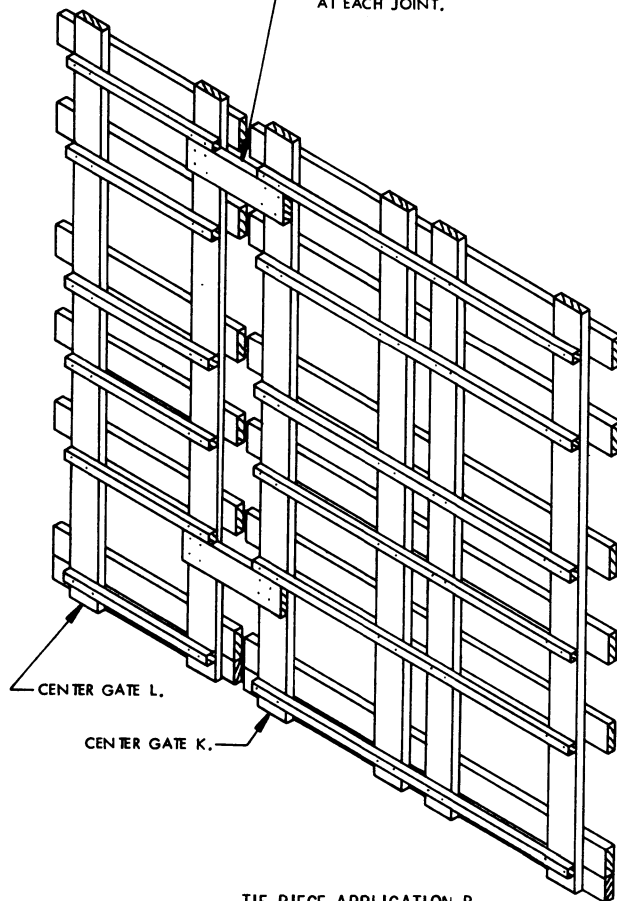
DETAILS

INDICATES A TYPICAL CENTER GATE FOR A SINGLE ROW (2 REQD). SEE THE APPLICABLE CENTER GATE DETAIL FOR UNITS WHICH ARE POSITIONED WITH THE UNIT LENGTH PARALLEL TO THE CAR SIDEWALL.



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

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



CENTER GATE L.

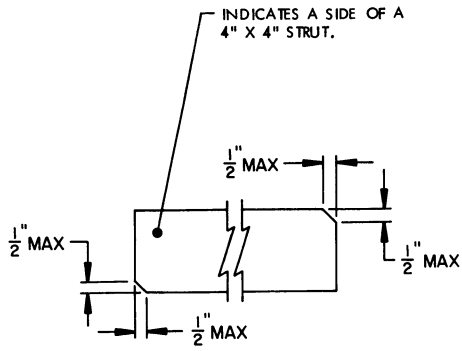
CENTER GATE K.

TIE PIECE APPLICATION A

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

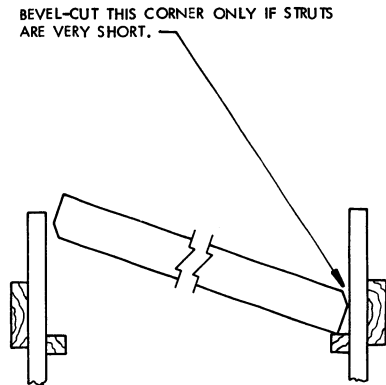
TIE PIECE APPLICATION B

THIS PROCEDURE IS APPLICABLE FOR USE WITH CENTER GATES "K" AND "L", CONSTRUCTED FOR CROSSWISE-POSITIONED UNITS. SEE THE DETAILS ON PAGE 78. NOTE THAT THE TIE PIECES SHOULD BE APPLIED AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED.



BEVEL CUT

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

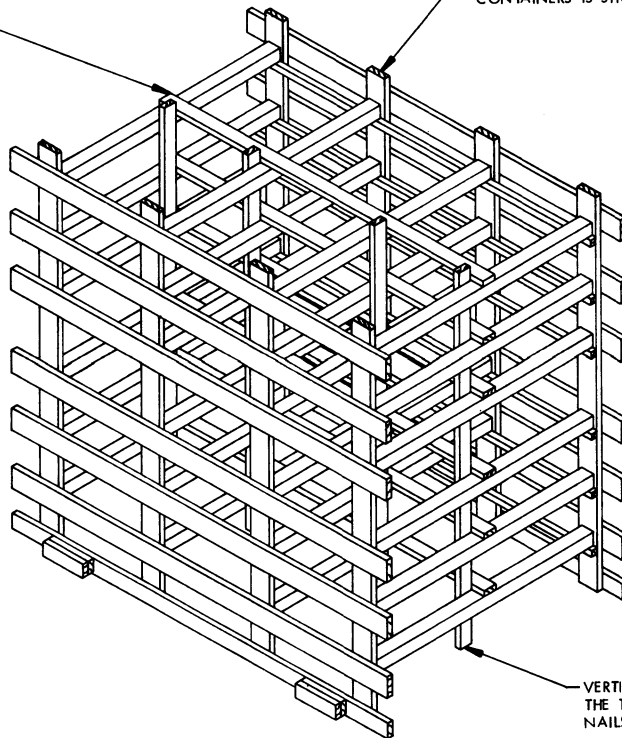


STRUT INSTALLATION

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

HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

A CENTER GATE FOR A 2-HIGH LOAD OF LENGTHWISE-POSITIONED CONTAINERS IS SHOWN AS TYPICAL.

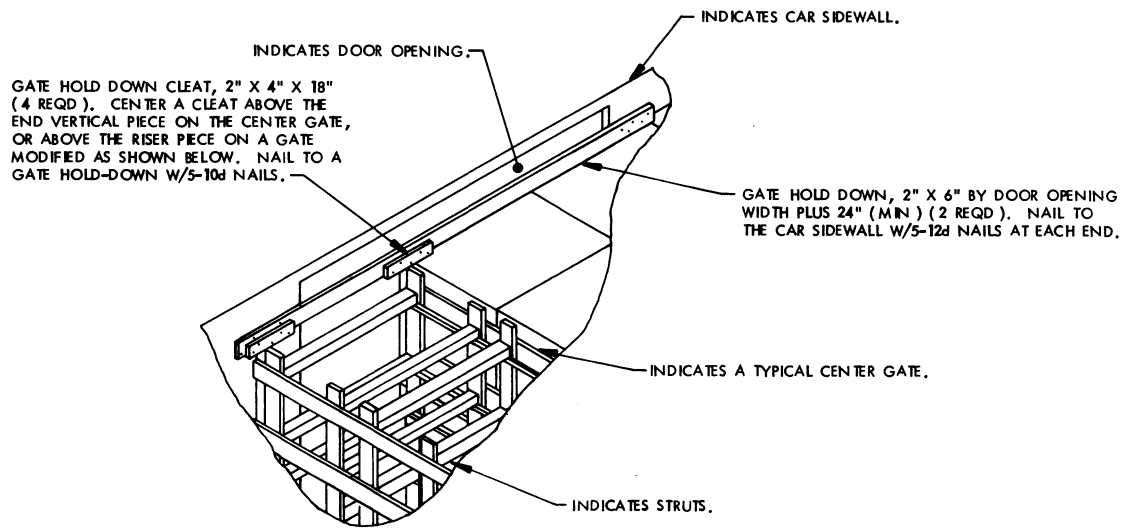


VERTICAL PIECE, 2" X 4" BY A LENGTH TO EXTEND 2" ABOVE THE TOP STRUT (AS REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

TYPICAL STRUT BRACING

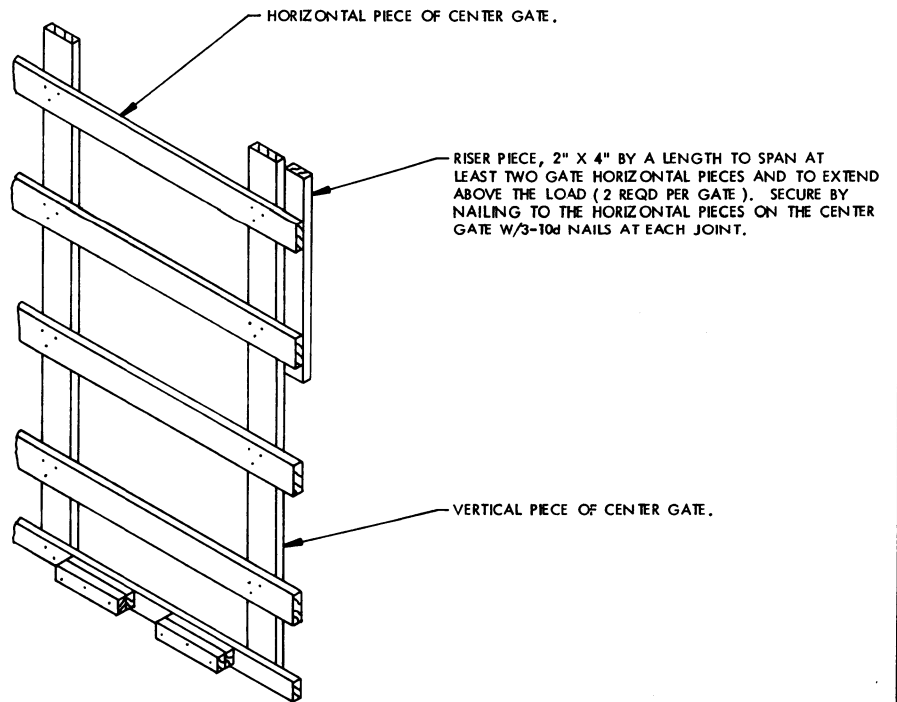
SEE GENERAL NOTE "V" ON PAGE 3.

DETAILS



ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD-DOWN WHICH CAN BE USED IF DESIRED, PROVIDING THE CAR HAS AVAILABLE 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.

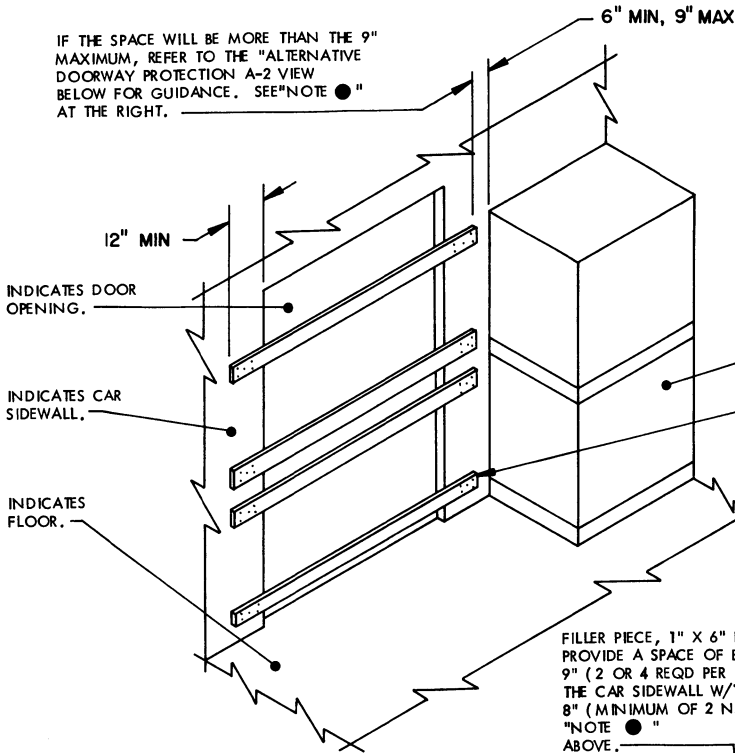


CENTER GATE MODIFICATION

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

DETAILS

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 ALL THE LOADS OF CROSSWISE UNITS, THE DOOR SPANNERS WILL BE POSITIONED TO BUTT AGAINST THE FILL MATERIAL AND THE TOLERANCE DIMENSION WILL NOT APPLY. ALSO, THE FILLER PIECES SHOWN IN THE ALTERNATIVE DOORWAY PROTECTION A-2 VIEW WILL NOT BE USED. NOTE THAT THE THICKNESS OF THE DOOR SPANNER PIECES MUST EQUAL THE THICKNESS OF THE LUMBER FILL MATERIAL THAT IS NAILED TO THE CAR SIDEWALL.

ALTERNATIVE DOORWAY PROTECTION A-1

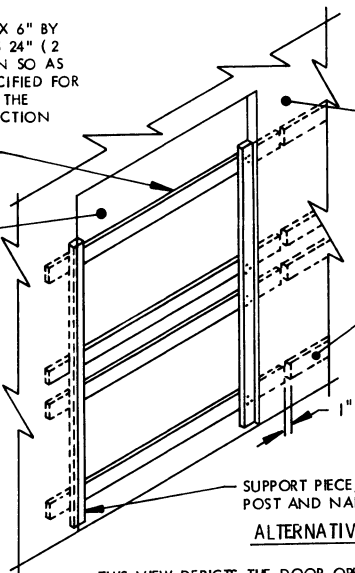
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS, HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE "ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 83 OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED IN THE LOAD VIEWS ON PAGES 12, 24, AND 36.

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.

INDICATES DOOR OPENING.
INDICATES CAR SIDEWALL.

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

INDICATES DOOR OPENING.



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

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.

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.

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

INDICATES A TYPICAL PALLET UNIT.

6" MIN, 9" MAX

12" MIN

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.

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

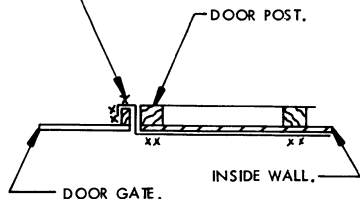
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES CAR SIDEWALL.

INDICATES DOOR OPENING.

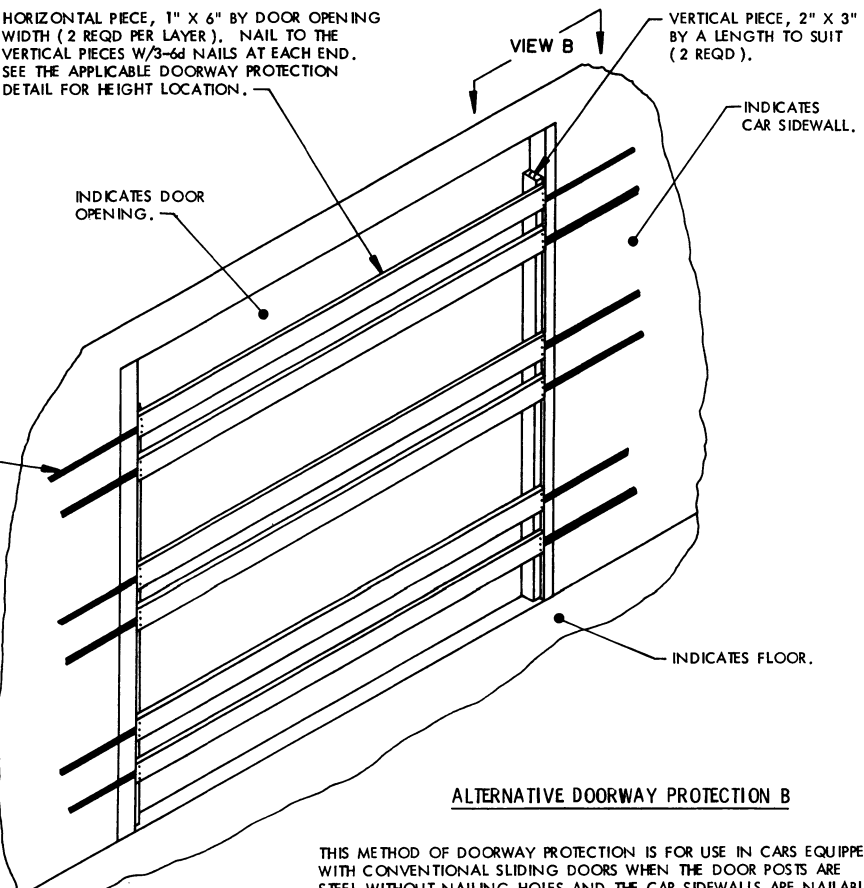
DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 3'-0" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

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



VIEW B

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



ALTERNATIVE DOORWAY PROTECTION B

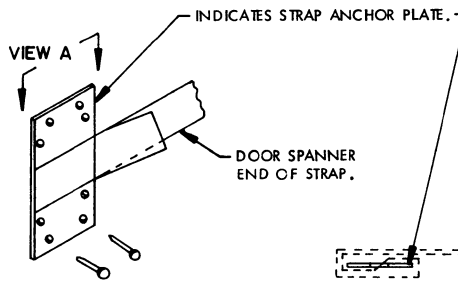
THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE STEEL WITHOUT NAILING HOLES AND THE CAR SIDEWALLS ARE NAILABLE. THE VIEW SHOWN ABOVE IS FOR A THREE-LAYER LOAD.

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

INDICATES DOOR OPENING.

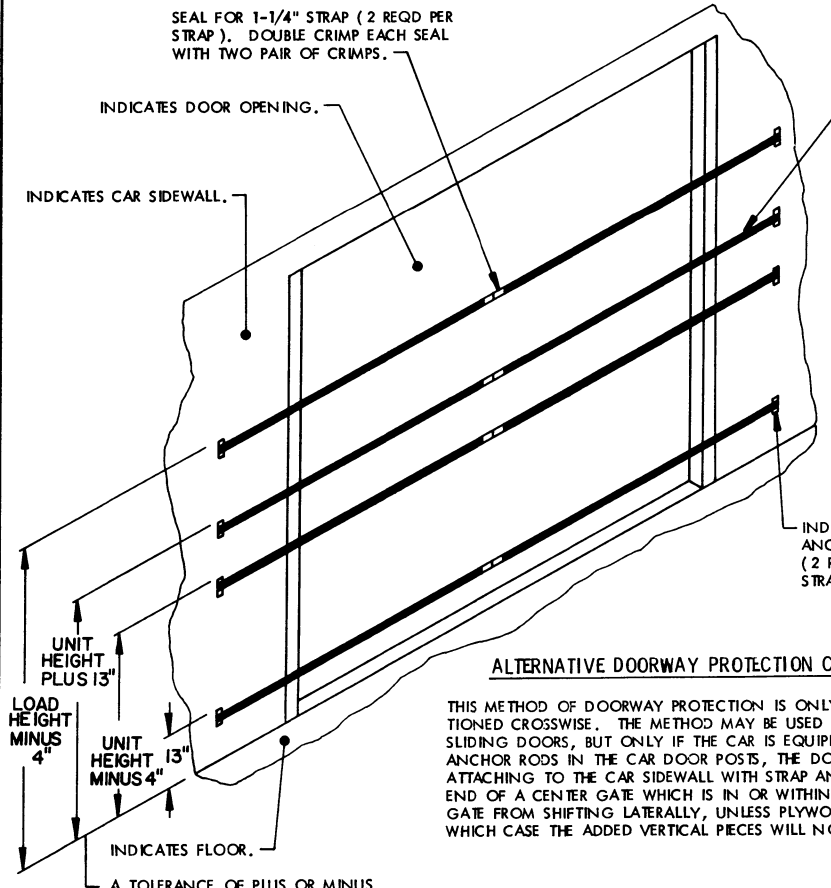
INDICATES CAR SIDEWALL.

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



APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

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

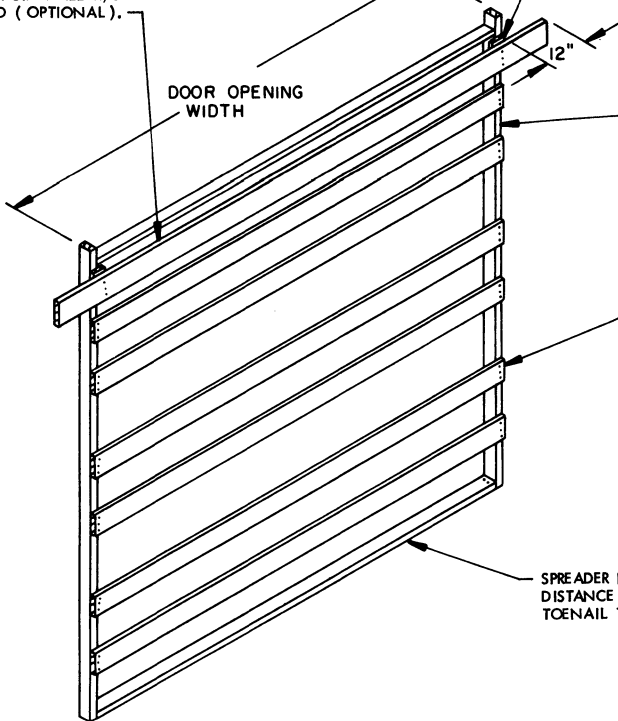


ALTERNATIVE DOORWAY PROTECTION C

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

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

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



DOOR OPENING WIDTH

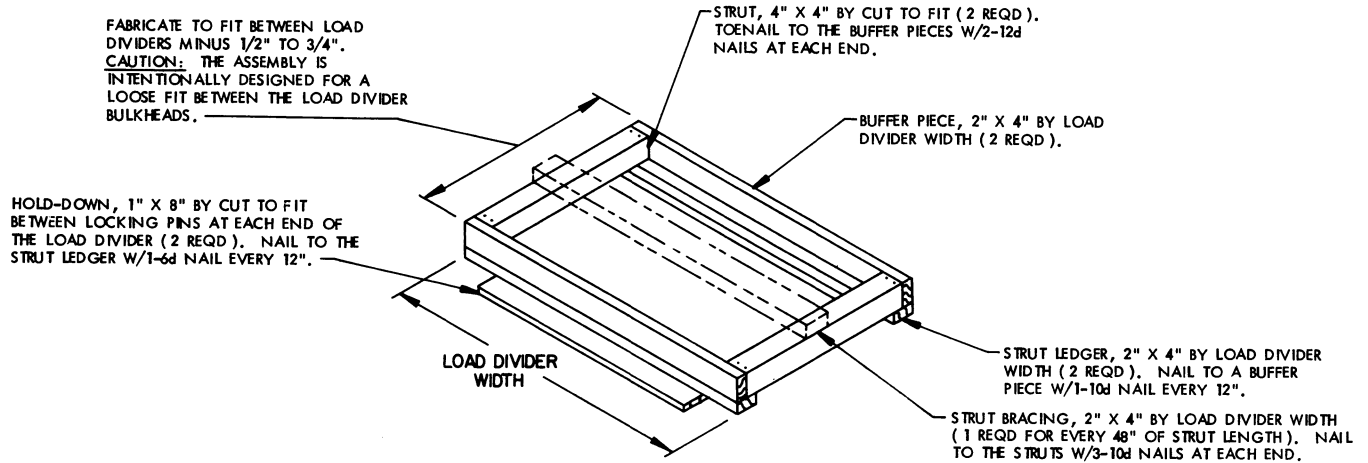
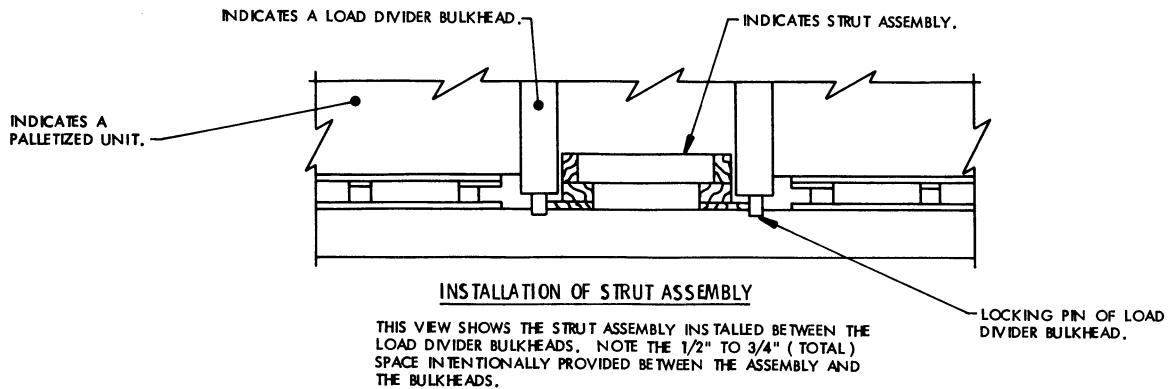
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD). NOTE THAT IF THE EXCESS SPACE ACROSS A CAR IS FILLED BY NAILING LUMBER TO THE CAR SIDEWALL, IT MAY BE NECESSARY TO INCREASE THE VERTICAL PIECES AND THE SPREADER PIECES TO 2" X 4" OR 2" X 6" MATERIAL. THIS WILL PROVIDE A SURFACE TO WEDGE BETWEEN THE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

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

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

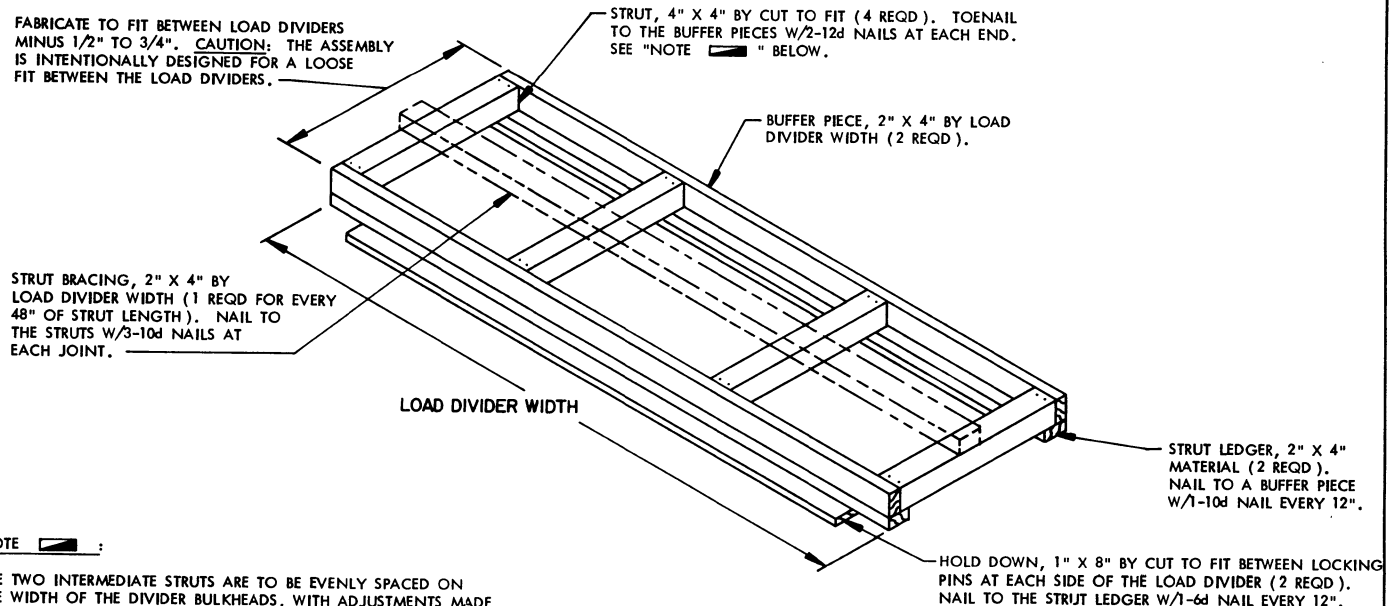
ALTERNATIVE DOORWAY PROTECTION D

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE NOT NAILABLE. IF THE CAR HAS NAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 83 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 81.



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 OF THE ASSEMBLIES SHOWN ABOVE ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE" BELOW.

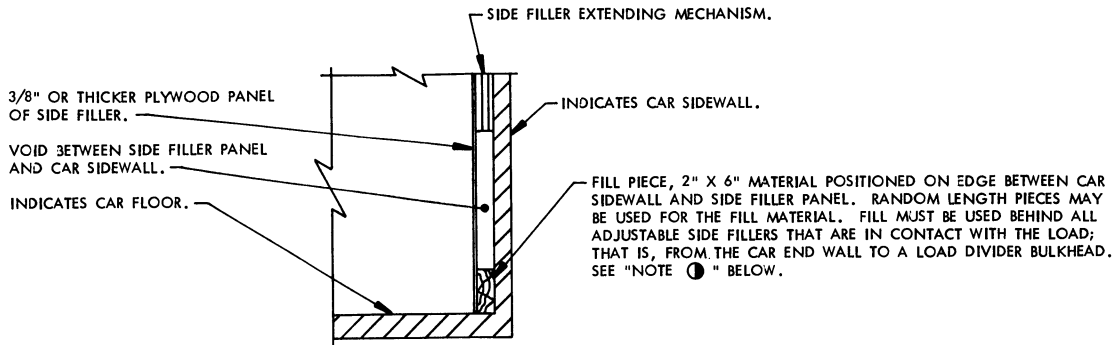


NOTE: [Symbol]

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

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

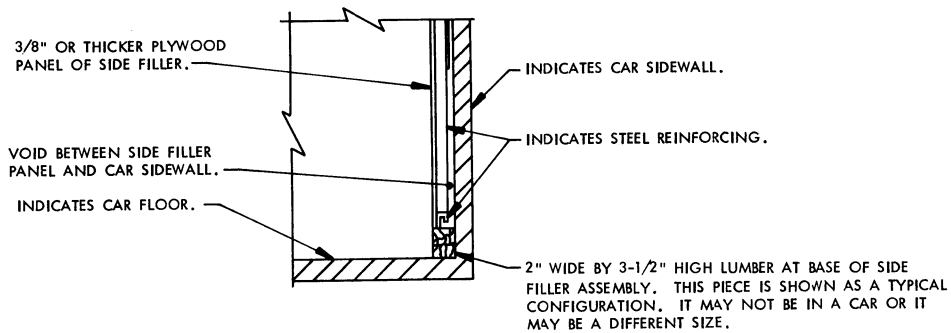


TYPICAL TYPE A

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

NOTE ① :

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



TYPICAL TYPE B

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