

APPROVED BY
 BUREAU OF EXPLOSIVES
J. H. Hershman
 DATE 11/9/92

LOADING AND BRACING (CL & LCL) IN BOX CARS OF PALLETIZED PROPELLING CHARGES PACKED IN CYLINDRICAL METAL CONTAINERS PA99 SERIES CONTAINER

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

DO NOT SCALE

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GENERAL NOTES

- A. THIS DOCUMENT HAS BEEN PREPARED AND ISSUED IN ACCORDANCE WITH AR 740-1 AND AUGMENTS TM 743-200-1 (CHAPTER 5).
- B. THE OUTLOADING PROCEDURES SPECIFIED IN THIS DRAWING ARE APPLICABLE FOR THE PA99 SERIES PROPELLING CHARGE CONTAINER WHEN UNITIZED ON A 35" X 45-1/2" PALLET. SEE THE PICTORIAL VIEWS ON PAGE 4. REFER TO THE US ARMY MATRIAL COMMAND DRAWING 19-48-4042A/20-20PM1001 FOR UNITIZATION PROCEDURES FOR THE PA99 SERIES CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, FOR SHIPMENTS IN BOX CARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. ALL THE LOADS SHOWN HEREIN ARE TYPICAL. BECAUSE OF THIS FACT IT IS MOST LIKELY THAT THE ACTUAL QUANTITY TO BE SHIPPED WILL NOT BE DEPICTED IN ANY OF THE LOADING PROCEDURES. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND AS TO THE EASE OF LOADING, FOR THE QUANTITY TO BE SHIPPED. THE LOAD PLANNING CHARTS ON PAGE 38 MAY BE USED IN CONJUNCTION WITH THE DEPICTED LOADING PROCEDURES FOR GUIDANCE.
- E. PALLET UNITS WILL BE POSITIONED WITH THE BASE ENDS OF CONTAINERS TOWARD THE CAR END WALL OR SIDEWALL AS APPLICABLE TO THE LOAD BEING SHIPPED. LONGITUDINALLY ADJACENT UNITS OF LENGTHWISE POSITIONED CONTAINERS WILL BE POSITIONED WITH BASE END TOWARD BASE END OR BELL END TOWARD BELL END. LONGITUDINALLY ADJACENT UNITS OF CROSSWISE POSITIONED CONTAINERS WILL ALL BE POSITIONED WITH THE BASE ENDS TOWARD THE CAR SIDEWALL TO PROVIDE FOR PROPER BEARING BETWEEN UNITS.
- F. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF PALLET 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.
- G. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN END WALL IS BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END OF CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. REFER TO PAGE 63 FOR GUIDANCE.
- H. 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.
- J. 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.
- K. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH PALLET UNITS OF PROPELLING CHARGES, PROVIDING THE TOTAL LOAD IS COMPATIBLE, EXISTING DIRECTIVES ARE NOT VIOLATED, AND THE OTHER LADING ITEMS ARE BLOCKED AND BRACED TO EQUAL THE BLOCKING AND BRACING CRITERIA SPECIFIED HEREIN. MIXED ITEMS TO BE SHIPPED IN CARS EQUIPPED WITH MECHANICAL BRACING DEVICES MUST BE SEPARATELY BLOCKED, USING THE PROCEDURES SHOWN FOR THESE CARS AS GUIDANCE.

(CONTINUED AT RIGHT)

MATERIAL SPECIFICATIONS

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

(GENERAL NOTES CONTINUED)

- L. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" WIDE AND 2" X 6" MATERIAL IS ACTUALLY 1-1/2" THICK BY 5-1/2" WIDE. IF THOSE MEMBERS SPECIFICALLY IDENTIFIED AS "STRUTS" WITHIN THE KEY NUMBERS OF A DEPICTED LOAD ARE SPECIFIED TO BE 4" X 4" MATERIAL, IT IS PERMISSIBLE TO USE TWO LAMINATED PIECES OF 2" X 6" MATERIAL IN LIEU OF EACH 4" X 4" STRUT. DOUBLED 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- M. **NOTE:** A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- N. POWER DRIVEN STAPLES MAY BE USED AS ALTERNATIVE FASTENERS FOR NAILS WHEN CONSTRUCTING DUNNAGE ASSEMBLIES WHICH ARE TO BE USED IN THE DELINEATED CAR LOADS SHOWN THROUGHOUT THIS DRAWING. THE STAPLES TO BE USED MUST BE EQUAL IN LENGTH TO THE SPECIFIED NAIL SIZE AND MUST BE SUBSTITUTED ON A ONE STAPLE FOR ONE NAIL BASIS. STAPLES WHICH ARE 2" OR LESS IN LENGTH SHOULD BE IN ACCORDANCE WITH FEDERAL SPECIFICATION FF-N-105 AS NEARLY AS PRACTICABLE. STAPLES WHICH ARE LONGER THAN 2-1/2" WILL BE COMMERCIAL GRADE, OF A QUALITY EQUIVALENT TO THOSE MANUFACTURED BY SENCO PRODUCTS INCORPORATED. **NOTE:** STAPLES WILL NOT BE SUBSTITUTED FOR NAILS IN ANY LOAD-RESTRAINING FLOOR DUNNAGE APPLICATION.
- O. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE (1) SEAL WITH TWO (2) PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH TYPE SEALER IS BEING USED. A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL WILL BE USED TO SEAL THE JOINT WHEN A CRIMP TYPE SEALER IS BEING USED. REFER TO THE "STRAP JOINT A" AND "STRAP JOINT B" DETAILS ON PAGE 33 FOR GUIDANCE.
- P. THROUGHOUT THIS PROCEDURAL DRAWING, PORTIONS OF THE BLOCKING COMPONENTS AND OF THE DEPICTED CARS, SUCH AS A CAR SIDEWALL, HAVE BEEN OMITTED FROM THE LOAD VIEW FOR CLARITY PURPOSES.
- Q. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED. HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. **NOTE:** A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- R. CONVERSION TO METRIC EQUIVALENTS: DIMENSIONS WITHIN THIS DOCUMENT ARE EXPRESSED IN INCHES, AND WEIGHTS ARE EXPRESSED IN POUNDS. WHEN NECESSARY, THE METRIC EQUIVALENTS MAY BE COMPUTED ON THE BASIS OF ONE INCH EQUALS 25.4MM AND ONE POUND EQUALS 0.454KG.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOX CARS)

- S. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS THAN FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "M" ABOVE.
- T. **NOTE:** WHEN POSITIONING PALLET UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND ARE TO BE PRESSED TIGHTLY TOGETHER LENGTHWISE SO AS TO ACHIEVE A TIGHT LOAD. TO AID IN ACHIEVING TIGHTNESS LENGTHWISE IN A FULL LOAD, A LOAD-COMPRESSING JACK MAY BE EMPLOYED IN THE AREA OF THE CENTER GATES TO MOVE THE PALLET UNITS INTO THEIR FINAL SHIPPING POSITION. A HYDRAULIC JACK IS RECOMMENDED FOR THIS OPERATION. **CAUTION:** WHEN USING A JACK TO COMPACT A LOAD, THE JACK MUST BE USED AGAINST STRONG POINTS OF THE PALLET UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS OF CONTAINERS ON THE UNIT. PADDING, OF 2-INCH (2") THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- U. 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 68. BRACING IS NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

(CONTINUED ON TOP OF PAGE 3 AT LEFT)

- V. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE. THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL THEN BE DRIVEN DOWNWARD UNTIL IT CONTACTS THE STRUT LEDGER ON THE OTHER GATE. EACH END OF THE STRUT WILL BE TOENAILED TO THE ADJACENT CENTER GATE, AS SPECIFIED WITHIN THE KEY NUMBERS FOR A LOAD, IN SUCH A MANNER SO THAT AS NEARLY AS PRACTICAL EQUAL LENGTHS OF A NAIL ARE EMBEDDED IN THE STRUT AND IN THE VERTICAL PIECE OF THE CENTER GATE. SEE THE "BEVEL CUT" DETAIL ON PAGE 68 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.
- W. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

(FOR BOX CARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

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

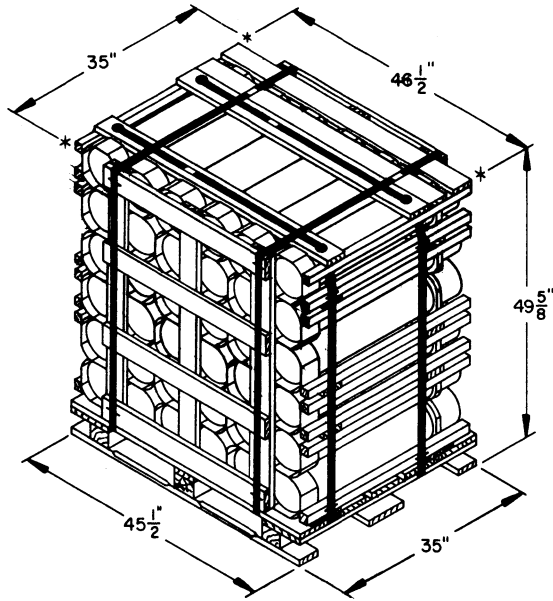
GENERAL NOTES

(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. **CAUTION:** FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, ONLY CARS EQUIPPED WITH LOAD DIVIDERS MANUFACTURED BY EVANS, EQUIPCO, OR PRECO MAY BE USED. LOAD DIVIDERS MANUFACTURED BY TRANSCO ARE NOT ACCEPTABLE, WHETHER OF ALUMINUM OR STEEL CONSTRUCTION. THE DEPICTED PROCEDURES ARE APPLICABLE FOR CARS OF VARIOUS LENGTHS AND WIDTHS. THE AAR MECHANICAL DESIGNATION CLASS FOR THESE CARS, AS IDENTIFIED IN "THE OFFICIAL RAILWAY EQUIPMENT REGISTER," WILL BE RBL, XL, OR XLI.
- BB. THE USE OF LOAD DIVIDER EQUIPPED CARS WILL ELIMINATE THE NEED FOR CENTER GATES AND STRUTS, AND GATE HOLD DOWNS (WHEN APPLICABLE) WHICH ARE REQUIRED IN CONVENTIONAL BOX CAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVING IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF PROPELLING CHARGES. **NOTICE:** ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END OF CAR TYPE DEVICES WHICH HAVE AT LEAST FIFTEEN INCHES (15") OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOX CARS EQUIPPED WITH ADJUSTABLE SIDE FILLERS THAT HAVE 3/8" OR THICKER PANELS MAY BE USED. HOWEVER, THESE SIDE FILLERS MUST NOT BE USED FOR LATERAL BLOCKING; THEY MUST BE RETRACTED AND LOCKED AGAINST THE CAR SIDEWALL. A "FILL PIECE" MUST BE INSTALLED IN THE VOID BETWEEN THE CAR SIDEWALL AND THE SIDE FILLER PANEL. SEE THE "TYPICAL TYPE A" VIEW ON PAGE 74 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 74, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.

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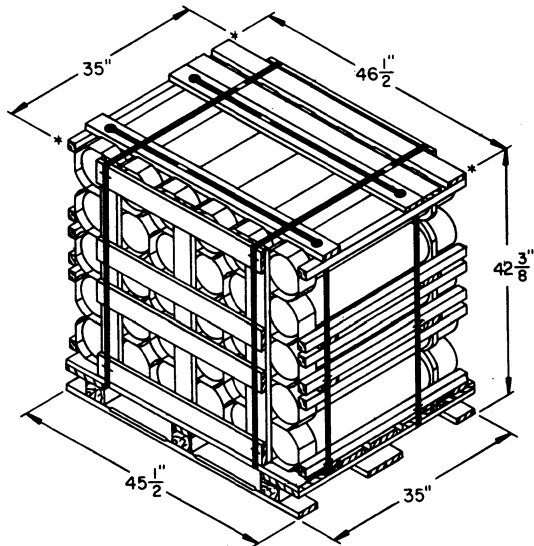
- DD. **NOTICE:** AFTER THE LOAD DIVIDER BULKHEADS ARE POSITIONED AGAINST THE LADING, AND THE LOCKING PINS ARE ENGAGED IN THE HOLES OF THE RAILS, THE LOWER LOCKING PINS MUST BE INSPECTED TO ENSURE THAT THE PINS ARE FULLY ENGAGED IN THE LOCKING HOLES. IF THE PINS ARE NOT FULLY SEATED IN THE LOCKING HOLES, THE LINKAGE MECHANISM WILL BE ADJUSTED AS REQUIRED SO THAT THE PINS WILL BE FULLY SEATED INTO THE LOCKING HOLES OF THE LOWER RAILS. IF PRESENT, DEBRIS MUST BE REMOVED FROM BENEATH THE LOCKING HOLES WHICH HAVE BEEN SELECTED FOR SECURING A LOAD DIVIDER BULKHEAD.
- EE. A "STRUT ASSEMBLY" MUST BE INSTALLED BETWEEN THE LOAD DIVIDER BULKHEADS IF THE CAR CONTAINS HAZARD CLASS AND DIVISION 1.1, 1.2, OR 1.3 EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES. **NOTE:** THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" BELOW. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 73.
- FF. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR END WALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF PALLETIZED UNITS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF CONTAINERS WHICH IS FULL CAR WIDTH BY FULL LOAD HEIGHT BY ONE UNIT IN LENGTH. IF THE QUANTITY TO BE SHIPPED CANNOT BE ATTAINED BY ADJUSTING THE NUMBER OF TIERS IN ONE OR BOTH ENDS OF A CAR, 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 44 THRU 47.
 - 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 40 THRU 43 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 58, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGES 54 AND 55.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



PALLET UNIT (BASIC HEIGHT)

CONTAINER ----- 36 EACH @ 43 LBS (APPROX)
 CUBE ----- 46.7 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,718 LBS (APPROX)

REFER TO PAGES 6 THRU 15 FOR OUTLOADING PROCEDURES .

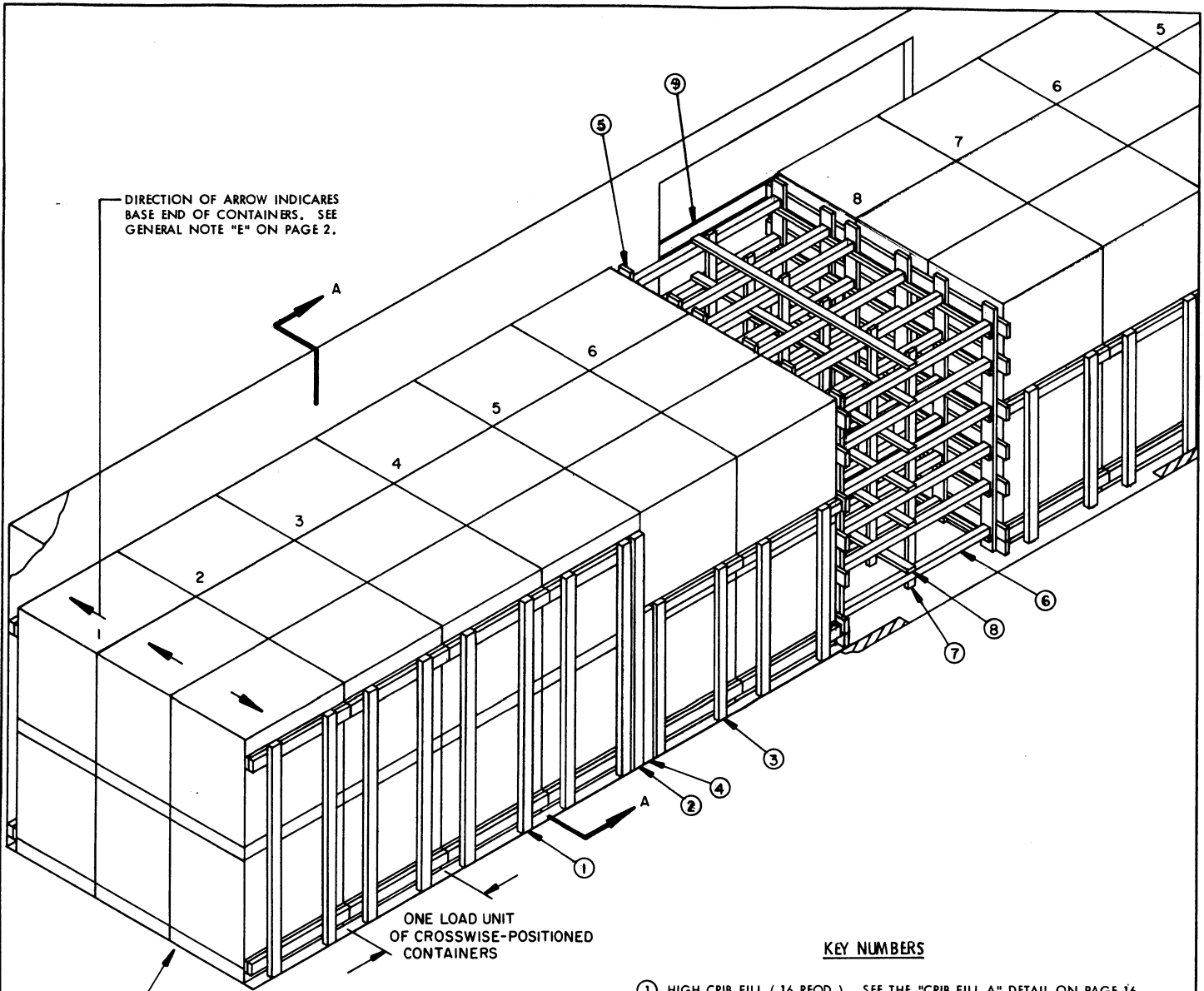


PALLET UNIT (DECREASED HEIGHT)

CONTAINER ----- 30 EACH @ 43 LBS (APPROX)
 CUBE ----- 39.9 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 1,442 LBS (APPROX)

REFER TO PAGES 20 THRU 29 FOR OUTLOADING PROCEDURES .

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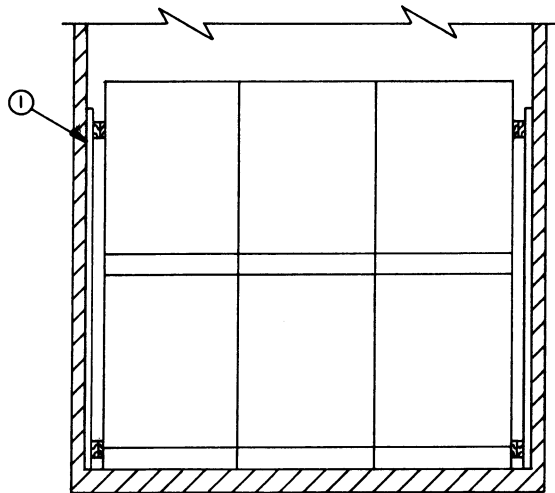
ISOMETRIC VIEW

SEE GENERAL NOTE "G" ON PAGE 2.

ONE LOAD UNIT OF CROSSWISE-POSITIONED CONTAINERS

KEY NUMBERS

- ① HIGH CRIB FILL (16 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 16. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL. SEE SPECIAL NOTES 3, 4, AND 6 ON PAGE 7. SEE GENERAL NOTE "M" ON PAGE 2.
- ② HIGH CRIB FILL STOP PIECE, 2" X 4" X 7'-8" (4 REQD). NAIL TO THE ENDS OF THE HORIZONTAL PIECES OF PIECE MARKED ① W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 7.
- ③ LOW CRIB FILL (12 REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 16. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL.
- ④ LOW CRIB FILL STOP PIECE, 2" X 4" X 61-1/2" (4 REQD). NAIL TO THE ENDS OF THE HORIZONTAL PIECES OF PIECE MARKED ③ W/2-10d NAILS AT EACH JOINT.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 16. SEE SPECIAL NOTES 7 THRU 10 ON PAGE 7.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 71") (36 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ⑦ VERTICAL STRUT BRACING, 2" X 4" X 8'-0" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" X 8'-6" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.
- ⑨ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 17. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 7.



SECTION A-A

PALLET UNIT (BASIC HEIGHT)
84-UNIT LOAD IN A 60'-8" LONG BY 9'-6" 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 THE DOORWAY BY ONE HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑤ THRU ⑧ ON PAGE 14 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.
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. THE ENTIRE TOP TIER CAN BE OMITTED, OR THE TOP TIER OF JUST THE MIDDLE ROW CAN BE OMITTED AS SHOWN IN THE LOAD ON PAGE 8. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.
15. THE CAR TO BE USED FOR SHIPMENT OF THE DEPICTED 84-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 148,900 POUNDS. EIGHTY-FOUR (84) PALLET UNITS CAN BE LOADED IN A CAR HAVING A LOAD LIMIT OF 146,400 POUNDS OR GREATER IF SEVEN (7) LOAD UNITS ARE PLACED IN EACH END OF THE CAR. THE PERMITTED 90-UNIT LOAD WILL REQUIRE A CAR HAVING A LOAD LIMIT OF AT LEAST 156,800 POUNDS. FOR A 72-UNIT LOAD IN A 50'-6" LONG CAR, A LOAD LIMIT OF AT LEAST 127,200 POUNDS IS REQUIRED IF AN OFFSET LOADING PATTERN IS USED, OR A LOAD LIMIT OF 125,200 POUNDS OR GREATER IF LOADED EVENLY. FOR A 54-UNIT LOAD IN A 40'-6" LONG CAR, A LOAD LIMIT OF AT LEAST 96,200 POUNDS IS REQUIRED.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-10" MINIMUM WIDTH) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 6. IF THE CAPACITY OF THE 60'-8" LONG CAR BEING USED PERMITS, SIX (6) ADDITIONAL PALLET UNITS CAN BE LOADED FOR AN APPROXIMATE LADING WEIGHT OF 154,350 POUNDS. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 123,480 POUNDS CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; FIFTY-FOUR (54) UNITS FOR A LADING WEIGHT OF 92,610 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR. IF IT IS DESIRED TO SHIP A SMALLER LOAD, REFER TO THE PROCEDURES SHOWN ON PAGE 8 FOR GUIDANCE. SEE SPECIAL NOTE 12.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 50'-6" OR 40'-6" LONG CAR. NOTE THAT CRIB FILL IS NOT REQUIRED IF THE CAR BEING LOADED IS 9'-0" OR LESS IN WIDTH.
4. IF THE DEPICTED LOAD, OR THE PERMITTED 90-UNIT LOAD, IS TO BE SHIPPED IN A 9'-2" WIDE CAR, CRIB FILL "E" AND CRIB FILL "F" AS DETAILED ON PAGES 17 AND 18, RESPECTIVELY, WILL BE USED IN LIEU OF PIECES MARKED ① AND ③ ON PAGE 6.
5. CRIB FILL STOP PIECES, PIECES MARKED ② AND ④, ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED ① AND ③, FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB AND LOW CRIB ARE ADJACENT TO EACH OTHER. THE CRIB FILL STOP PIECES MUST BE 1" X 4" MATERIAL IN LIEU OF 2" X 4" MATERIAL WHEN LOADING IN A 9'-2" WIDE CAR. AT THE LOCATIONS WHERE CRIB FILL STOP PIECES ARE REQUIRED, OMIT THE 7-1/4" LONG FILL PIECES FROM CRIB FILL "E" AND "F" AND REPLACE WITH THE CRIB FILL STOP PIECES. STOP PIECES WILL BE APPLIED AT THE ENDS OF THE HORIZONTAL PIECES. NAIL W/3-6d NAILS AT EACH JOINT AND CLINCH. NOTE THAT 2" X 4" STOP PIECES AS SPECIFIED IN KEY NUMBERS ② AND ④ ARE ADEQUATE FOR A 9'-4" WIDE CAR.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALL IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED ① THRU ④. MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, DOUBLED 2" X 4" FOR A 9'-4" CAR, AND DOUBLED 2" X 4" PLUS A 1" X 4" FOR A 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENING. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24". AND 2" X 4" FILL W/1-10d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. CENTER GATE "A", PIECE MARKED ⑤, WILL BE BUILT 9'-1-1/2" WIDE FOR CARS WHICH ARE 9'-2" OR GREATER IN WIDTH. THE GATES WILL BE CONSTRUCTED TO BE CAR WIDTH MINUS ONE-HALF INCH IN WIDTH FOR CARS LESS THAN 9'-2" WIDE, AND WILL HAVE THE VERTICAL PIECES PLACED AT 5-1/4" AND 27-1/2" FROM EACH END AND AT 40-1/4" AND 62-1/2" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS GIVEN ON THE CENTER GATE DETAIL; RIGHT HAND AND LEFT HAND REQUIRED.
8. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE A" DETAIL ON PAGE 67 FOR GUIDANCE.
9. FOR EASE OF HANDLING, SPLIT CENTER GATES WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE A", SHOWN AS PIECE MARKED ⑤, IN THE LOAD ON PAGE 6, INSTALL TWO (2) "CENTER GATES J" AND TWO (2) "CENTER GATES K" AS DETAILED ON PAGE 64. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR BEING LOADED IS 9'-2" OR LESS IN WIDTH AND ALSO PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAIL ON PAGE 69 FOR GUIDANCE.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	219	73
1" X 6"	80	40
2" X 2"	103	35
2" X 3"	33	17
2" X 4"	742	495
2" X 6"	220	220
4" X 4"	213	284
NAILS	NO. REQD	POUNDS
6d (2")	272	1-1/2
10d (3")	984	15-1/4
12d (3-1/4")	32	3/4
16d (3-1/2")	144	3-1/4

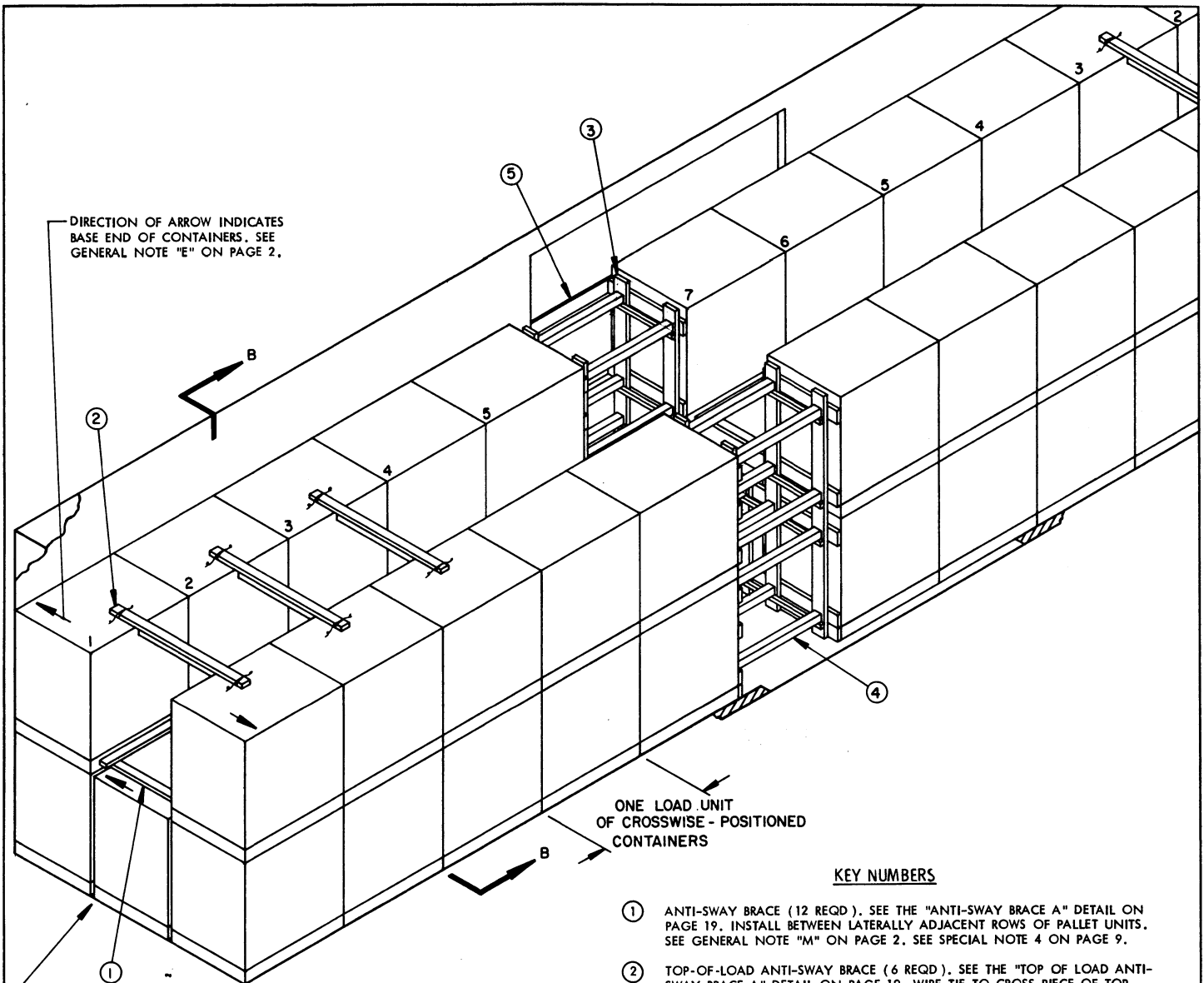
LOAD AS SHOWN

ITEM QUANTITY WEIGHT (APPROX)

PALLET UNIT----- 84 ----- 144,060 LBS
 DUNNAGE ----- 2,348 LBS

TOTAL WEIGHT-----146,408 LBS (APPROX)

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



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

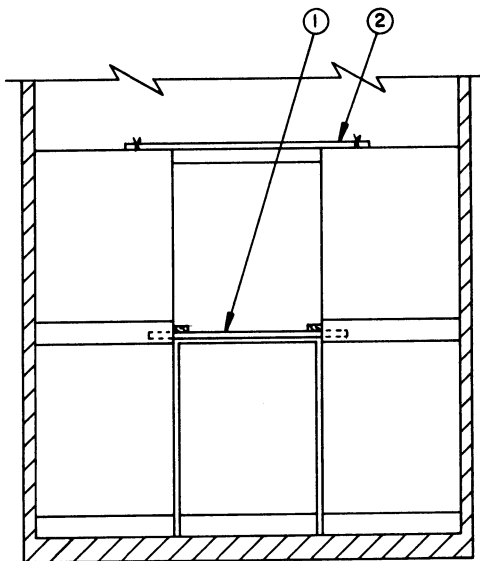
SEE GENERAL NOTE
"G" ON PAGE 2.

ISOMETRIC VIEW

ONE LOAD UNIT
OF CROSSWISE-POSITIONED
CONTAINERS

KEY NUMBERS

- ① ANTI-SWAY BRACE (12 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2. SEE SPECIAL NOTE 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP OF LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECE OF TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 63. SEE SPECIAL NOTE 5 ON PAGE 9.
- ③ CENTER GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE "CENTER GATE B" DETAIL ON PAGE 17. SEE SPECIAL NOTES 6 THRU 8 AND 14 ON PAGE 9.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 42") (20 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION A" DETAIL ON PAGE 17. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 9.



SECTION B-B

PALLET UNIT (BASIC HEIGHT)
60-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY A MULTIPLE OF FIVE (5) PALLET UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. THE ENTIRE TOP TIER CAN BE OMITTED, AND MULTIPLES OF THREE (3) PALLET UNITS CAN BE OMITTED FROM THE ONE LAYER LOAD. OR, THE CENTER ROW OF THE BOTTOM LAYER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.
13. IF THE 50'-6" LONG CAR BEING LOADED DOES NOT HAVE A LOAD LIMIT OF AT LEAST 106,100 POUNDS, THE 60-UNIT LOAD MUST BE FORMED WITH SIX (6) LOAD UNITS IN EACH END. IF A 60'-8" LONG CAR IS LOADED USING THE DEPICTED LOADING PATTERN, A CAR HAVING A LOAD LIMIT OF AT LEAST 124,300 POUNDS WILL BE REQUIRED FOR THE SHIPMENT OF A 70-UNIT OR 130,900 POUNDS FOR A 75-UNIT LOAD.
14. CENTER GATE "B", PIECE MARKED ③, WILL BE BUILT TO BE CAR WIDTH MINUS 1/2" FOR CARS WHICH ARE LESS THAN 9'-2" WIDE; RIGHT HAND AND LEFT HAND GATES WILL THEN BE REQUIRED. THE GATES WILL BE CONSTRUCTED 9'-1-1/2" FOR CARS 9'-2" OR WIDER, AND WILL HAVE THE VERTICAL PIECES PLACED AT 7-3/4" AND 30" FROM EACH END AND AT 42-3/4" AND 65" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS GIVEN ON THE CENTER GATE DETAIL. BOTH GATES WILL BE MADE ALIKE FOR CARS 9'-2" OR WIDER.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-10" MINIMUM WIDTH) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTES 3 AND 4 BELOW.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 8. A MAXIMUM OF FORTY-FIVE (45) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 77,175 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; IF A 60'-8" LONG CAR IS AVAILABLE, SEVENTY (70) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 120,050 POUNDS OR PERHAPS SEVENTY-FIVE (75) UNITS FOR AN APPROXIMATE WEIGHT OF 128,625 POUNDS CAN BE PLACED. IF THE LOAD LIMIT OF THE CAR PERMITS, SIX (6) PALLET UNITS CAN BE PLACED WITHIN EACH LOAD UNIT. SEE THE PROCEDURES ON PAGES 6 AND 7 FOR GUIDANCE. SEE SPECIAL NOTE 13.
3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' THRU 10' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX (6) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
4. IF THE CAR FURNISHED FOR LOADING IS WIDER THAN 9'-0", CRIB FILL MUST BE INSTALLED BETWEEN THE PALLET UNITS AND THE CAR SIDEWALL ON BOTH SIDES OF THE LOAD. SEE THE "CRIB FILL A" AND "CRIB FILL B" DETAILS ON PAGE 16 AND THE TYPICAL INSTALLATION SHOWN BY PIECES MARKED ① THRU ④ ON PAGE 6.
5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 63. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40 OR 50 FOOT CARS; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60 FOOT CAR.
6. CENTER GATE "B" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE B" DETAIL ON PAGE 67 FOR GUIDANCE.
7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE B", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 8, INSTALL TWO (2) "CENTER GATES J" AND TWO (2) "CENTER GATES K" AS SHOWN ON PAGE 64. NOTE THAT THE "CENTER GATES K" MUST BE MODIFIED FOR USE WITH THREE PALLET UNITS IN LIEU OF FOUR. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO THE CENTER GATE "B", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 69 FOR GUIDANCE. THIS TYPE GATE HOLD DOWN IS NOT APPLICABLE FOR CARS WIDER THAN 9'-2".
9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 8, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑥ THRU ⑧ ON PAGE 14 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.

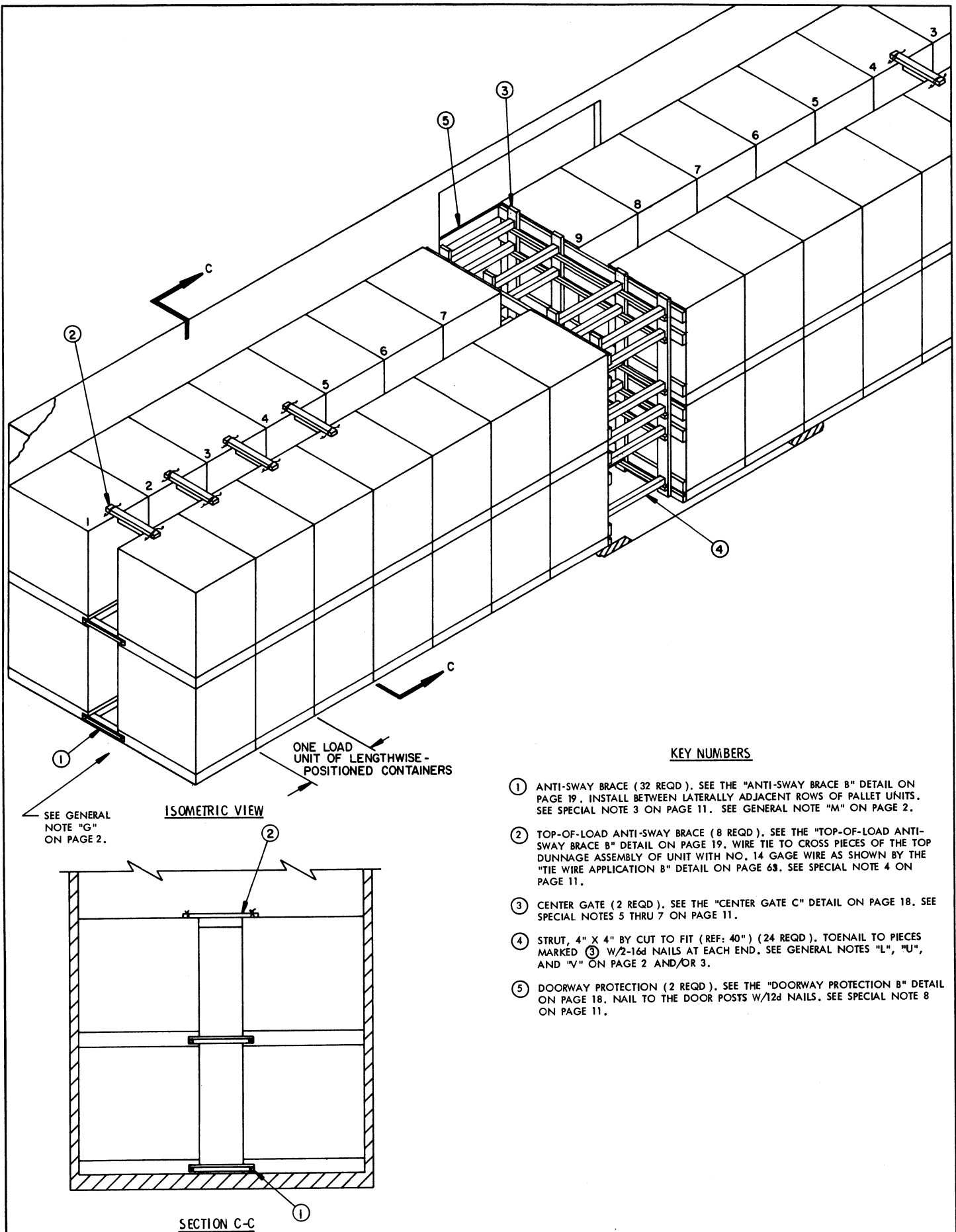
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	54	18
2" X 3"	33	17
2" X 4"	228	152
2" X 6"	177	177
4" X 4"	70	94
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	384	6
12d (3-1/4")	62	1-1/4
16d (3-1/2")	80	1-3/4
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	60 -----	102,900 LBS
DUNNAGE -----	-----	1,007 LBS
TOTAL WEIGHT -----		103,907 LBS

PALLET UNIT (BASIC HEIGHT)
60-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL BOX CAR



KEY NUMBERS

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE SPECIAL NOTE 3 ON PAGE 11. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 68. SEE SPECIAL NOTE 4 ON PAGE 11.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 18. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 11.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 40") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION B" DETAIL ON PAGE 18. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 11.

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD LINED CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE LOAD ON PAGE 10. A MAXIMUM OF FIFTY-TWO (52) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 89,180 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG CAR IS AVAILABLE, SEVENTY-SIX (76) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 130,340 POUNDS, OR EIGHTY (80) UNITS FOR APPROXIMATELY 137,200 POUNDS, CAN BE LOADED. SEE SPECIAL NOTE 11.
3. IF THE ALTERNATIVE DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED ⑤, NAILED FLOOR LINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR. SEE SPECIAL NOTE 8 BELOW.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 10, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD FOR 40' AND 50' CARS. NOTE THAT FIVE (5) BRACES WILL BE REQUIRED IN EACH END OF A LOAD FOR 60' CARS.
5. CENTER GATE "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE C" DETAIL ON PAGE 67 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE C", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 10, INSTALL TWO (2) "CENTER GATES L" AS DETAILED ON PAGE 65. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE "C", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAIL ON PAGE 69 FOR GUIDANCE.
8. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ④ IN THE LOAD ON PAGE 10, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ③ THRU ⑥ ON PAGE 28 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.
11. IF THE DEPICTED LOADING PATTERN IS USED IN A 60'-8" LONG CAR, A 76-UNIT LOAD WILL REQUIRE A CAR HAVING A LOAD LIMIT OF AT LEAST 132,800 POUNDS; AN 80-UNIT LOAD WILL REQUIRE A CAR HAVING A LOAD LIMIT OF AT LEAST 139,600 POUNDS IF LOADED IN AN OFFSET LOADING PATTERN OR 138,800 POUNDS IF LOADED EVENLY. FOR THE DEPICTED LOAD, THE CAR MUST HAVE A LOAD LIMIT OF AT LEAST 112,600 POUNDS.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	130	44
1" X 6"	64	32
2" X 2"	296	99
2" X 3"	39	20
2" X 4"	152	102
2" X 6"	193	193
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
6d (2")	496	3
10d (3")	544	8-1/2
12d (3-1/4")	64	1-1/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ----- 90' REQD ----- 2 LBS		

LOADS AS SHOWN

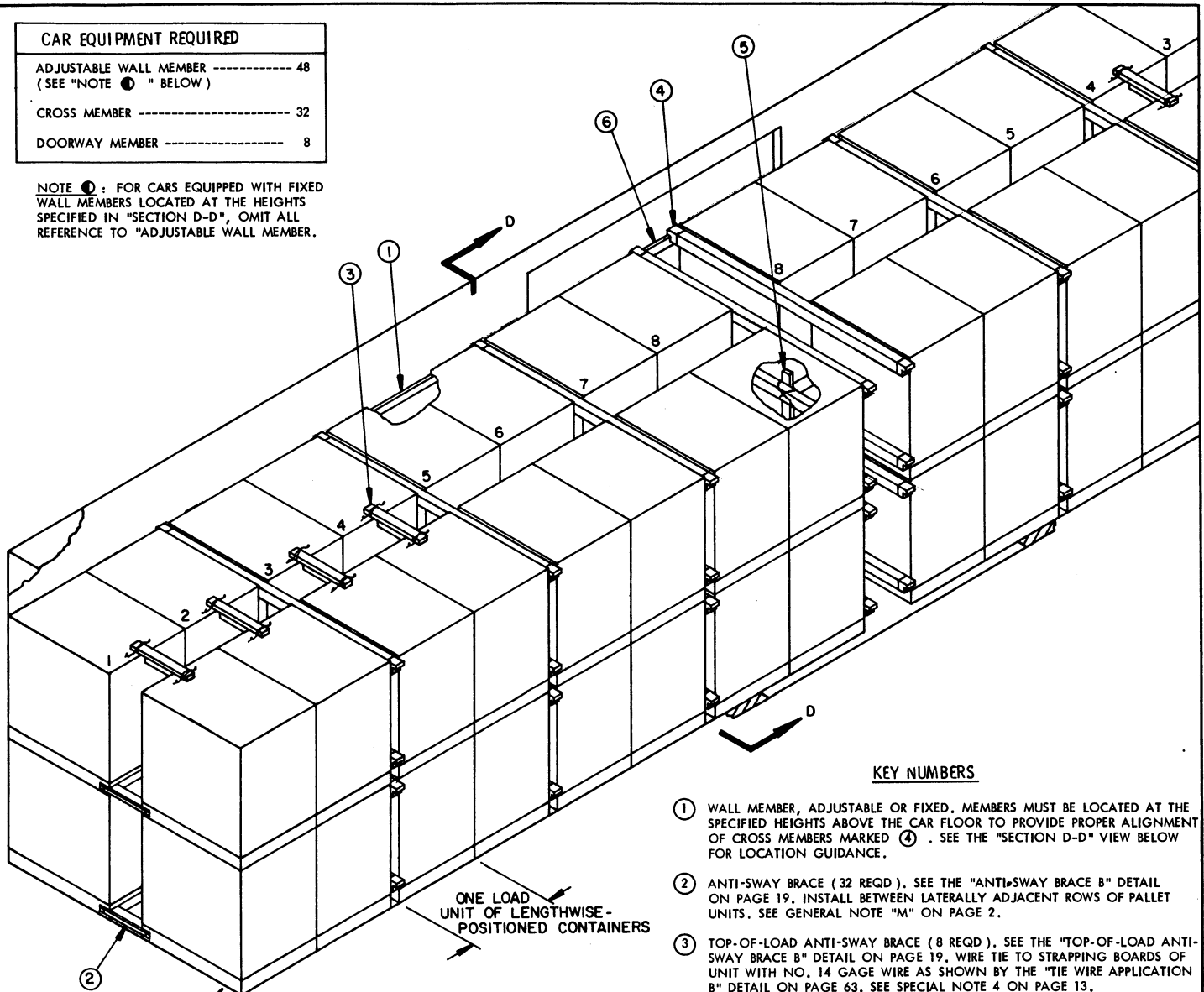
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	64	109,760 LBS
DUNNAGE -----		1,211 LBS
TOTAL WEIGHT -----		110,971 LBS

PALLET UNIT (BASIC HEIGHT)
64-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

CAR EQUIPMENT REQUIRED

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

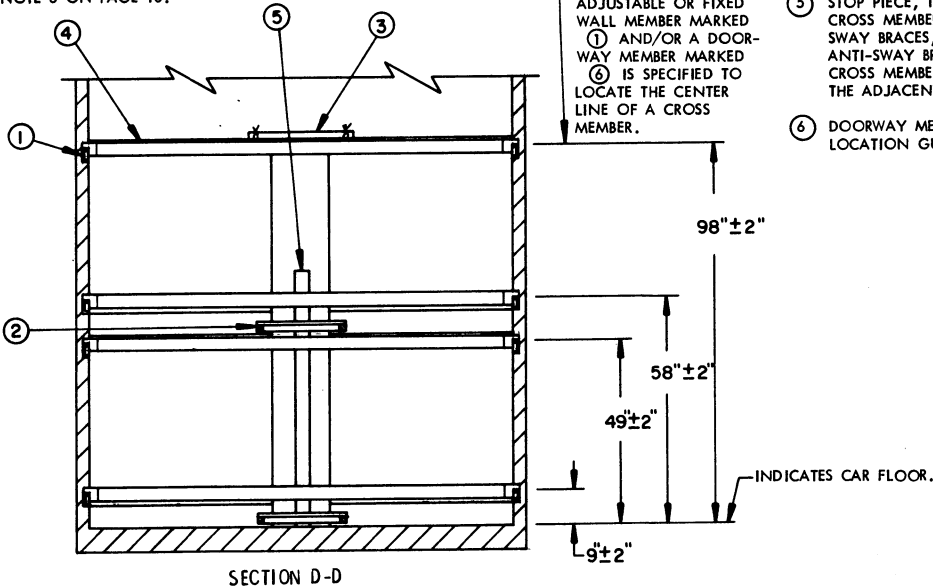
NOTE 1: FOR CARS EQUIPPED WITH FIXED WALL MEMBERS LOCATED AT THE HEIGHTS SPECIFIED IN "SECTION D-D", OMIT ALL REFERENCE TO "ADJUSTABLE WALL MEMBER."



SEE GENERAL NOTE "G" ON PAGE 2, AND SPECIAL NOTE 3 ON PAGE 13.

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 D-D

KEY NUMBERS

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 4. SEE THE "SECTION D-D" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO STRAPPING BOARDS OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. SEE SPECIAL NOTE 4 ON PAGE 13.
- 4 CROSS MEMBER (32 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 5 STOP PIECE, 1" X 4" X 66" (14 REQD). INSTALL AT EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION TO PREVENT DISPLACEMENT OF ANTI-SWAY BRACES, PIECE MARKED 2. NAIL TO THE CROSS BRACE OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON NEAR SIDE OF CROSS MEMBERS, WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE.
- 6 DOORWAY MEMBER (8 REQD). SEE THE "SECTION D-D" VIEW AT LEFT FOR LOCATION GUIDANCE.

PALLET UNIT (BASIC HEIGHT)

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 12. A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 82,320 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 "SQUARE END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "G" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 12, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40' AND 50' CARS.
5. STOP PIECES, SHOWN AS PIECES MARKED ⑤ IN THE LOAD ON PAGE 12, ARE REQUIRED TO PREVENT THE ANTI-SWAY BRACES, PIECE MARKED ②, FROM MOVING INTO THE VOID AREA FORMED BY THE CROSS MEMBERS AND/OR THE VOID AT THE CENTER OF THE CAR. SECUREMENT OF THE STOP PIECE IS EXPLAINED WITHIN KEY NUMBER ⑤ ON PAGE 12.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 34 AND 35 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.

BILL OF MATERIAL

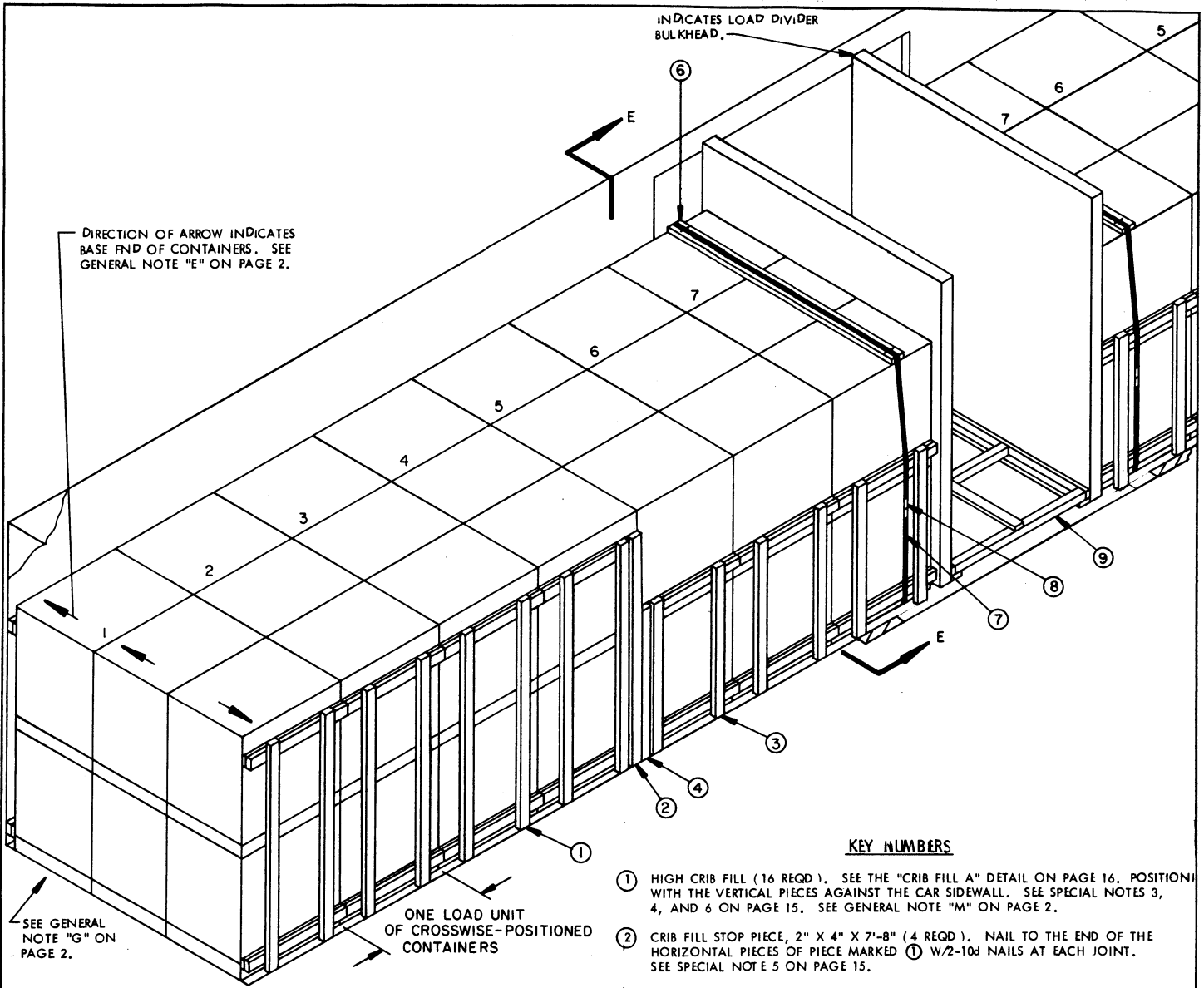
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	197	66
2" X 2"	186	62
2" X 4"	123	82
NAILS	NO. REQD	POUNDS
6d (2")	480	3
10d (3")	256	4
12d (3-1/4")	32	3/4
WIRE, NO. 14 GAGE ----- 90' REQD ----- 2 LBS		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	64 -----	109,670 LBS
DUNNAGE -----		430 LBS
TOTAL WEIGHT -----		110,190 LBS

PALLET UNIT (BASIC HEIGHT)

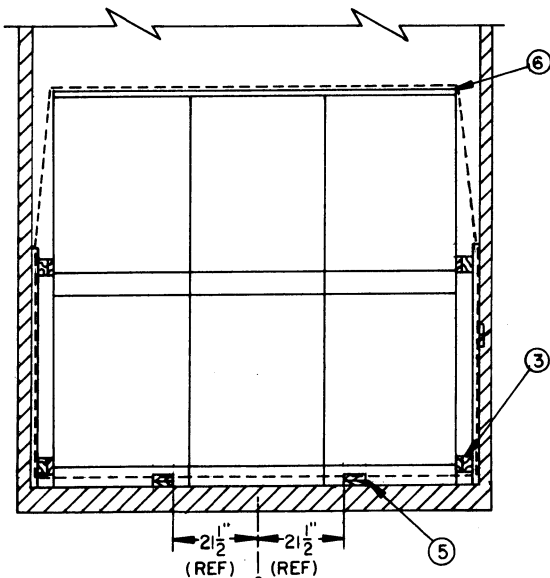
64-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE BOX CAR EQUIPPED WITH MECHANICAL BRACING DEVICES



ISOMETRIC VIEW

KEY NUMBERS

- ① HIGH CRIB FILL (16 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 16. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL. SEE SPECIAL NOTES 3, 4, AND 6 ON PAGE 15. SEE GENERAL NOTE "M" ON PAGE 2.
- ② CRIB FILL STOP PIECE, 2" X 4" X 7'-8" (4 REQD). NAIL TO THE END OF THE HORIZONTAL PIECES OF PIECE MARKED ① W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 15.
- ③ LOW CRIB FILL (12 REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 16. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL.
- ④ CRIB FILL STOP PIECE, 2" X 4" X 61-1/2" (4 REQD). NAIL TO THE END OF THE HORIZONTAL PIECES OF PIECE MARKED ③ W/2-10d NAILS AT EACH JOINT.
- ⑤ DOORWAY BLOCKING, 2" X 6" X 38" (DOUBLED) (4 REQD). PRE-POSITION AS SHOWN IN THE "SECTION E-E" VIEW BELOW AND SO AS TO BE CENTERED AGAINST THE PALLETS IN THE DOORWAY. 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 NOTE 8 ON PAGE 15.
- ⑥ STRAPPING BOARD, 2" X 6" X 8'-9" (2 REQD).
- ⑦ DOORWAY PROTECTION STRAP, 1-1/4" X .035" X 36'-0" LONG STEEL STRAPPING (2 REQD). INSTALL TO ENCIRCLE THE LOAD UNITS IN THE DOORWAY AREA, THE CRIB FILL, PIECE MARKED ③, AND THE STRAPPING BOARD, PIECE MARKED ⑥. STAPLE TO THE STRAPPING BOARD W/3 STAPLES. SEE SPECIAL NOTE 9 ON PAGE 15.
- ⑧ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑨ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 73. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 10 ON PAGE 15.



SECTION E-E

PALLET UNIT (BASIC HEIGHT)

84-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

(SPECIAL NOTES CONTINUED)

9. TWO (2) DOORWAY PROTECTION STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM SIX INCHES (6") TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.
10. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑨ IN THE LOAD ON PAGE 14, IS REQUIRED WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60' OR LONGER CARS.
11. WHEN PALLET UNITS ARE LOADED WITH THE CONTAINERS LENGTHWISE IN THE CAR, THE BLOCKING AND BRACING DUNNAGE WILL BE DIFFERENT THAN THAT SHOWN. ANTI-SWAY BRACES AND TOP-OF-LOAD ANTI-SWAY BRACES WILL BE USED AS SHOWN BY PIECES MARKED ① AND ② ON PAGE 10 OR PAGE 28. SIDE BLOCKING, SPACER ASSEMBLIES, DOORWAY PROTECTION STRAP AND SEALS WILL BE AS SHOWN BY PIECES MARKED ③ THRU ⑥ ON PAGE 28 EXCEPT THAT THE STRAP WILL BE 36'-0" LONG IN LIEU OF 34'-6" LONG.
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, OR THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-10" MINIMUM WIDTH) AND CAR HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 14. A MAXIMUM OF SEVENTY TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 123,480 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR, OR A MAXIMUM OF FIFTY-FOUR (54) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 92,610 POUNDS WHEN USING THE DEPICTED PROCEDURES. IF THE CAPACITY OF THE 60'-8" CAR BEING LOADED PERMITS, SIX (6) ADDITIONAL PALLET UNITS CAN BE LOADED FOR A TOTAL LADING WEIGHT OF APPROXIMATELY 154,350 POUNDS. IF DESIRED, PALLET UNITS CAN BE LOADED WITH THE CONTAINERS ON THE UNIT LENGTHWISE IN LIEU OF CROSSWISE AS SHOWN. THEN SEVENTY-SIX (76) UNITS CAN BE LOADED IN A 60'-8" LONG CAR FOR AN APPROXIMATE LADING WEIGHT 130,430 POUNDS, SIXTY-FOUR (64) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR A LADING WEIGHT OF APPROXIMATELY 109,760 POUNDS OR FORTY-EIGHT (48) CAN BE LOADED IN A 40'-6" LONG CAR FOR A LOAD OF APPROXIMATELY 82,320 POUNDS. SEE SPECIAL NOTE 9 FOR LOADING GUIDANCE FOR USE WHEN THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS LENGTHWISE IN THE CAR. SEE SPECIAL NOTES 13 AND 14.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" OR 40'-6" LONG CAR. NOTE THAT CRIB FILL IS NOT REQUIRED IF THE CAR BEING LOADED IS 9'-0" OR LESS IN WIDTH.
4. IF THE DEPICTED LOAD, OR THE PERMITTED 90-UNIT LOAD, IS TO BE SHIPPED IN A 9'-2" WIDE CAR, CRIB FILL "E" AND CRIB FILL "F", AS DETAILED ON PAGES 17 AND 18, RESPECTIVELY, WILL BE USED IN LIEU OF PIECES MARKED ① AND ③ ON PAGE 14.
5. CRIB FILL STOP PIECES, PIECES MARKED ② AND ④ ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED ① AND ③, FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB AND LOW CRIB ARE ADJACENT TO EACH OTHER. THE CRIB FILL STOP PIECES MUST BE 1" X 4" MATERIAL IN LIEU OF 2" X 4" MATERIAL WHEN LOADING IN A 9'-2" WIDE CAR. AT THE LOCATIONS WHERE CRIB FILL STOP PIECES ARE REQUIRED, OMIT THE 7-1/4" LONG FILL PIECES FROM THE CRIB FILL ASSEMBLIES AND REPLACE WITH THE CRIB FILL STOP PIECES. STOP PIECES WILL BE APPLIED AT THE ENDS OF THE HORIZONTAL PIECES. NAIL W/3-6d NAILS AT EACH JOINT AND CLINCH. NOTE THAT 2" X 4" STOP PIECES AS SPECIFIED IN KEY NUMBERS ② AND ④ ARE ADEQUATE FOR A 9'-4" WIDE CAR.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALL IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED ① THRU ④. MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, DOUBLED 2" X 4" FOR A 9'-4" CAR, AND DOUBLED 2" X 4" PLUS A 1" X 4" FOR 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENING. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24" AND 2" X 4" FILL W/1-10d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. LOW CRIB FILL ASSEMBLIES ARE TO BE INSTALLED AT THE SIDES OF ALL LOAD UNITS IN THE CENTER PORTION OF THE LOAD UNLESS THE LOAD UNIT IS COMPLETELY WITHIN THE DOOR OPENING. THE LAST LOW CRIB FILL TO BE INSTALLED ON EACH END AND SIDE OF THE LOAD MUST BE WIRE TIED TO PREVENT DISPLACEMENT. WITH NO. 14 GAGE OR HEAVIER WIRE, ENCIRCLE THE CENTER POST OF THE ADJACENT SECOND-LAYER PALLET AND THE VERTICAL PIECE OF THE CRIB FILL WHICH IS NEAREST THE CENTER OF THE CAR AND TWIST TAUT. NOTE THAT DEPENDING UPON THE WIDTH OF THE CAR DOOR, IT MAY BE NECESSARY TO FASTEN THE WIRE AROUND THE PALLET POST PRIOR TO PLACEMENT OF THE PALLET UNIT. IF THE LAST CRIB FILL IN AN END HAS A DOORWAY PROTECTION STRAP, PIECE MARKED ⑦, EXTENDING OVER IT THE WIRE TIE IS NOT REQUIRED.
8. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE NAILED FLOOR-LINE BLOCKING AND DOORWAY PROTECTION STRAP PROCEDURE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ⑤ THRU ⑧ IN THE LOAD ON PAGE 14, IS APPLICABLE FOR BOX CARS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR PLUG DOOR CARS CAN ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.

(CONTINUED AT LEFT)

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	219	73
1" X 8"	17	12
2" X 4"	684	456
2" X 6"	44	44
4" X 4"	21	28
NAILS	NO. REQD	POUNDS
6d (2")	242	1-1/2
10d (3")	390	6
12d (3-1/4")	16	1/2
16d (3-1/2")	32	3/4
STEEL STRAPPING, 1-1/4" X .031" OR .035" --72' REQD--- 11 LBS		
SEAL FOR 1-1/4" STRAPPING----- 4 REQD--- NIL		
STAPLE FOR 1-1/4" STRAPPING----- 6 REQD--- NIL		

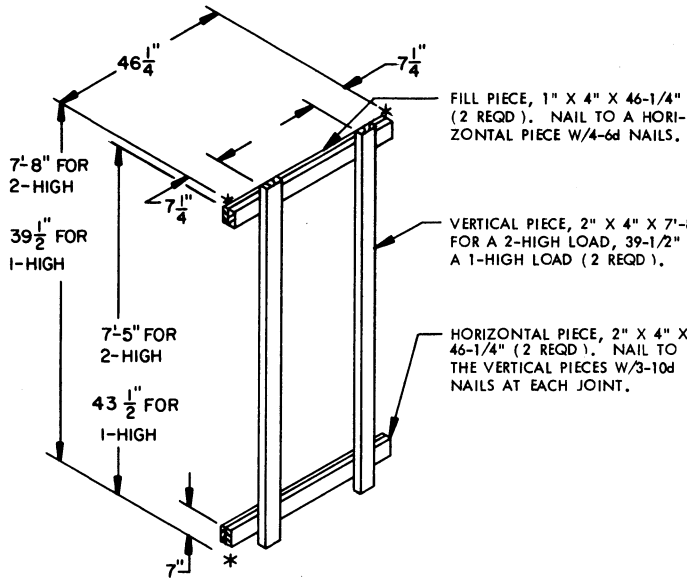
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT-----	84	144,060 LBS
DUNNAGE-----		1,247 LBS

TOTAL WEIGHT-----145,307 LBS (APPROX)

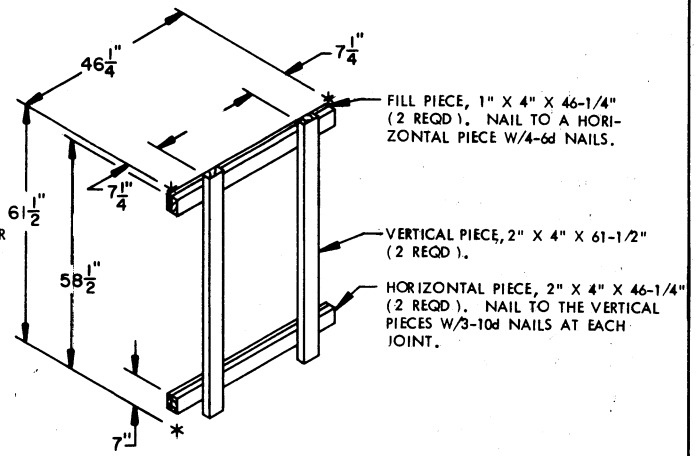
PALLET UNIT (BASIC HEIGHT)

84-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS



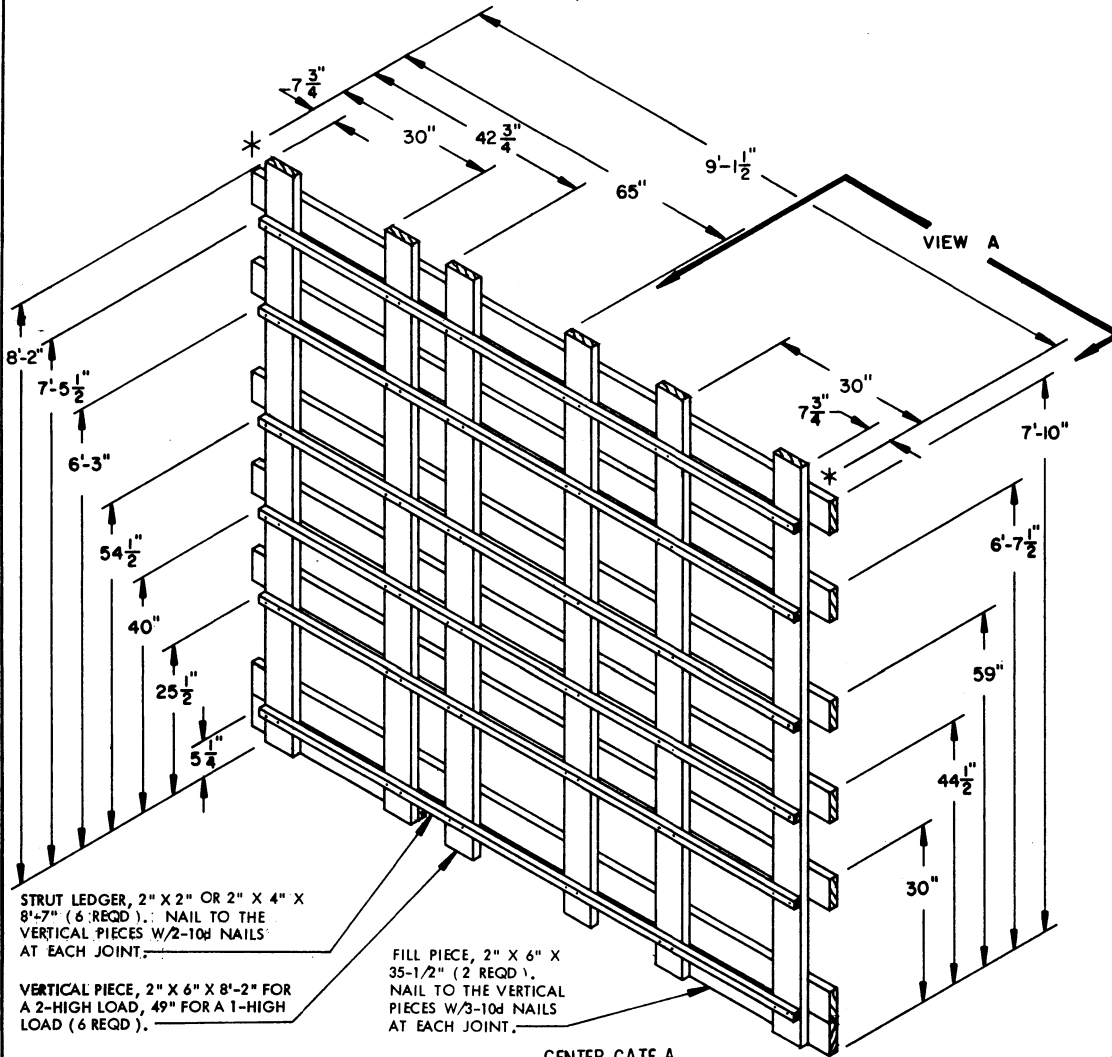
CRIB FILL A

THIS ASSEMBLY IS FOR USE IN A 9'-6" WIDE CAR FOR THE LOAD ON PAGE 6, 8, OR 14. FOR USE IN A 9'-4" WIDE CAR, OMIT THE 1" X 4" FILL PIECES. SEE "CRIB FILL E" ON PAGE 17 FOR AN ASSEMBLY TO USE IN A 9'-2" WIDE CAR.



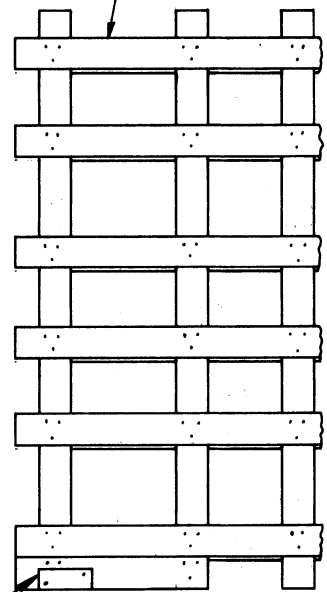
CRIB FILL B

THIS ASSEMBLY IS FOR USE IN A 9'-6" WIDE CAR FOR THE LOAD ON PAGE 6, 8, OR 14. FOR USE IN A 9'-4" WIDE CAR, OMIT THE 1" X 4" FILL PIECES. SEE "CRIB FILL F" ON PAGE 18 FOR AN ASSEMBLY TO USE IN A 9'-2" WIDE CAR. CRIB FILL "B" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "A" THROUGHOUT THE LENGTH OF THE LOAD.

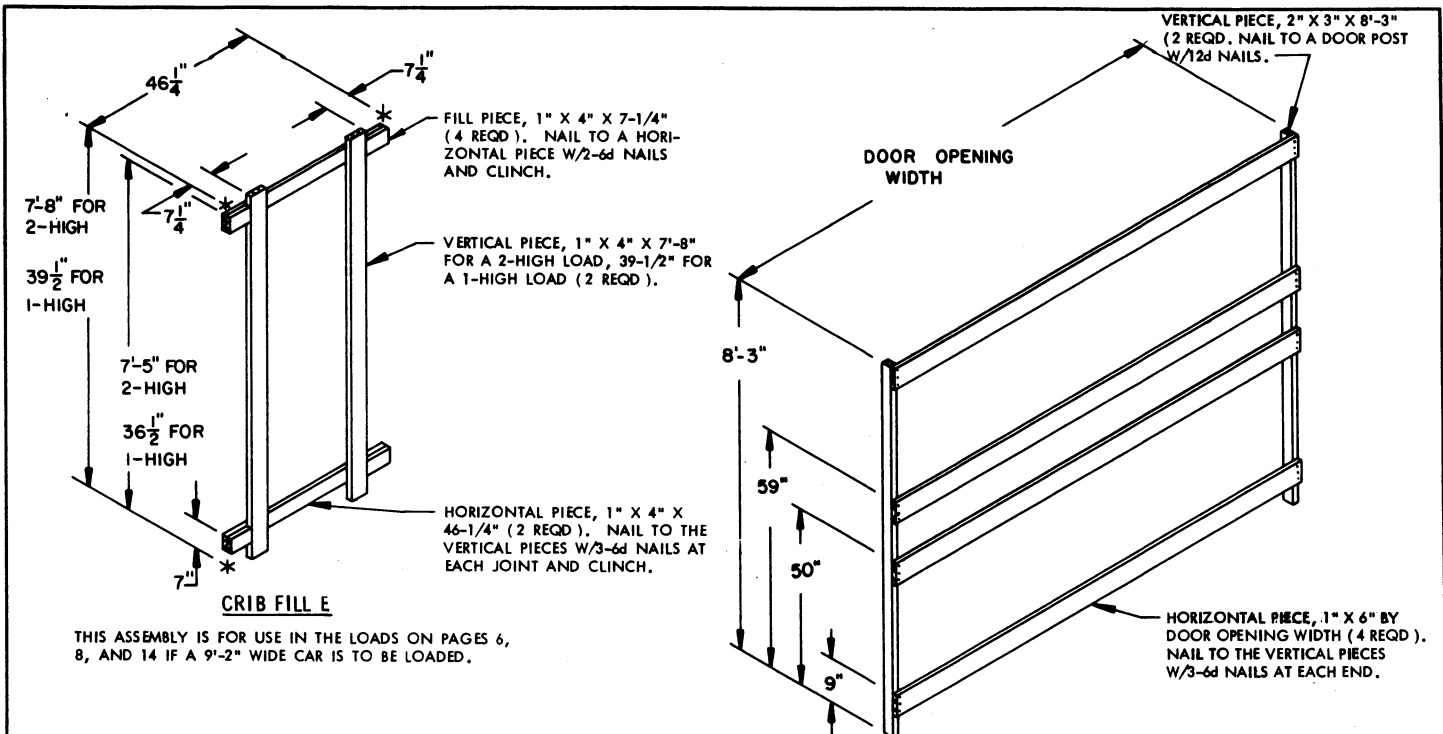


CENTER GATE A

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 6. SEE SPECIAL NOTE 7 ON PAGE 7.

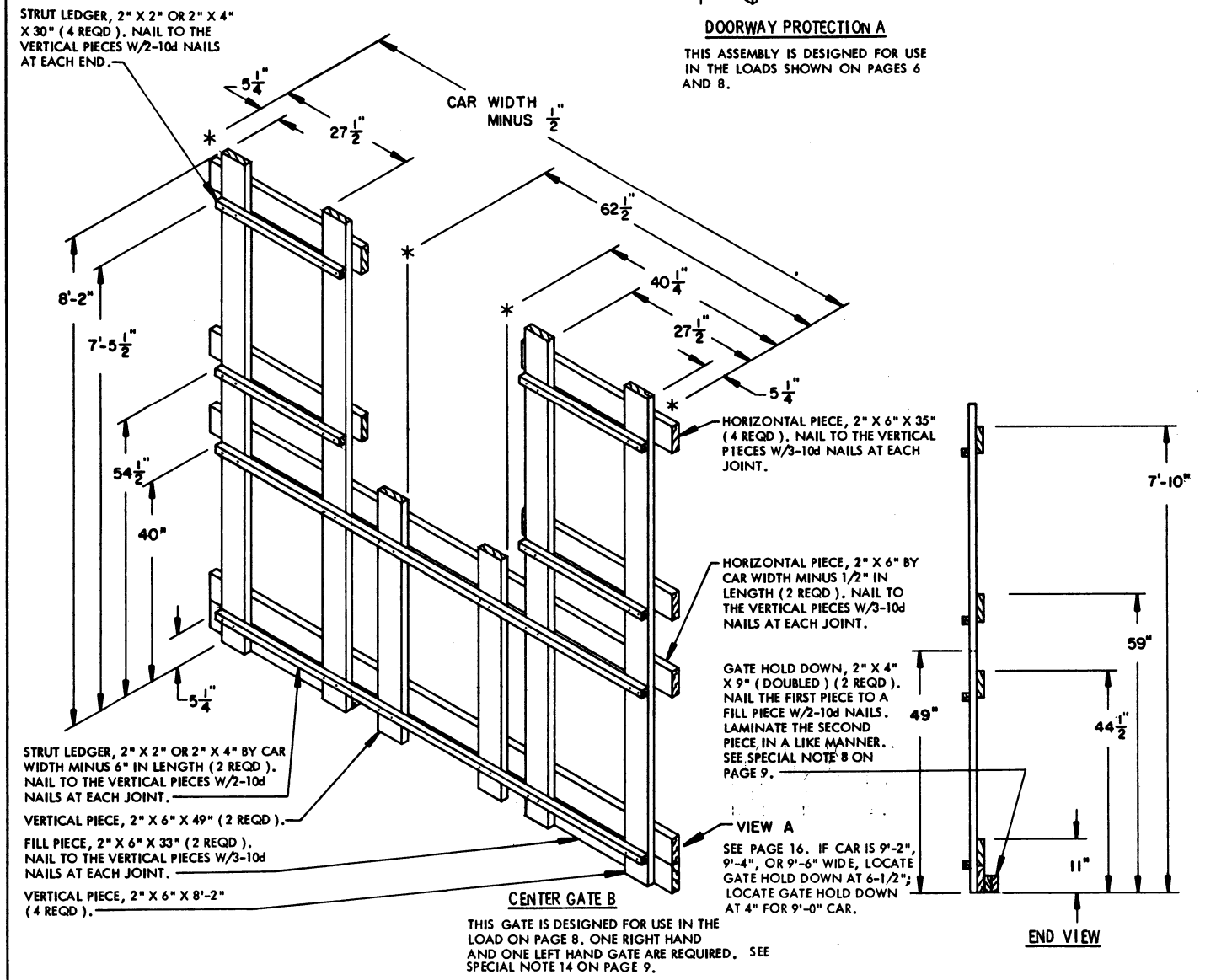


VIEW A



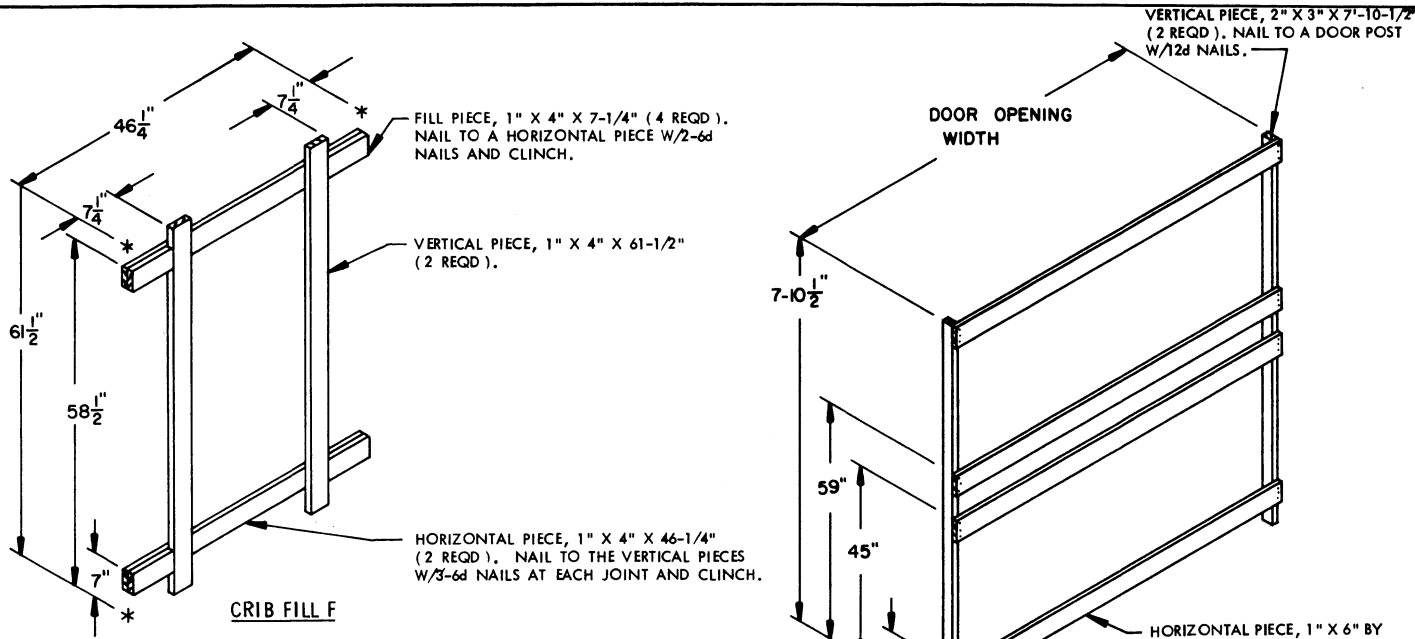
CRIB FILL E
 THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 6, 8, AND 14 IF A 9'-2" WIDE CAR IS TO BE LOADED.

DOORWAY PROTECTION A
 THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 6 AND 8.



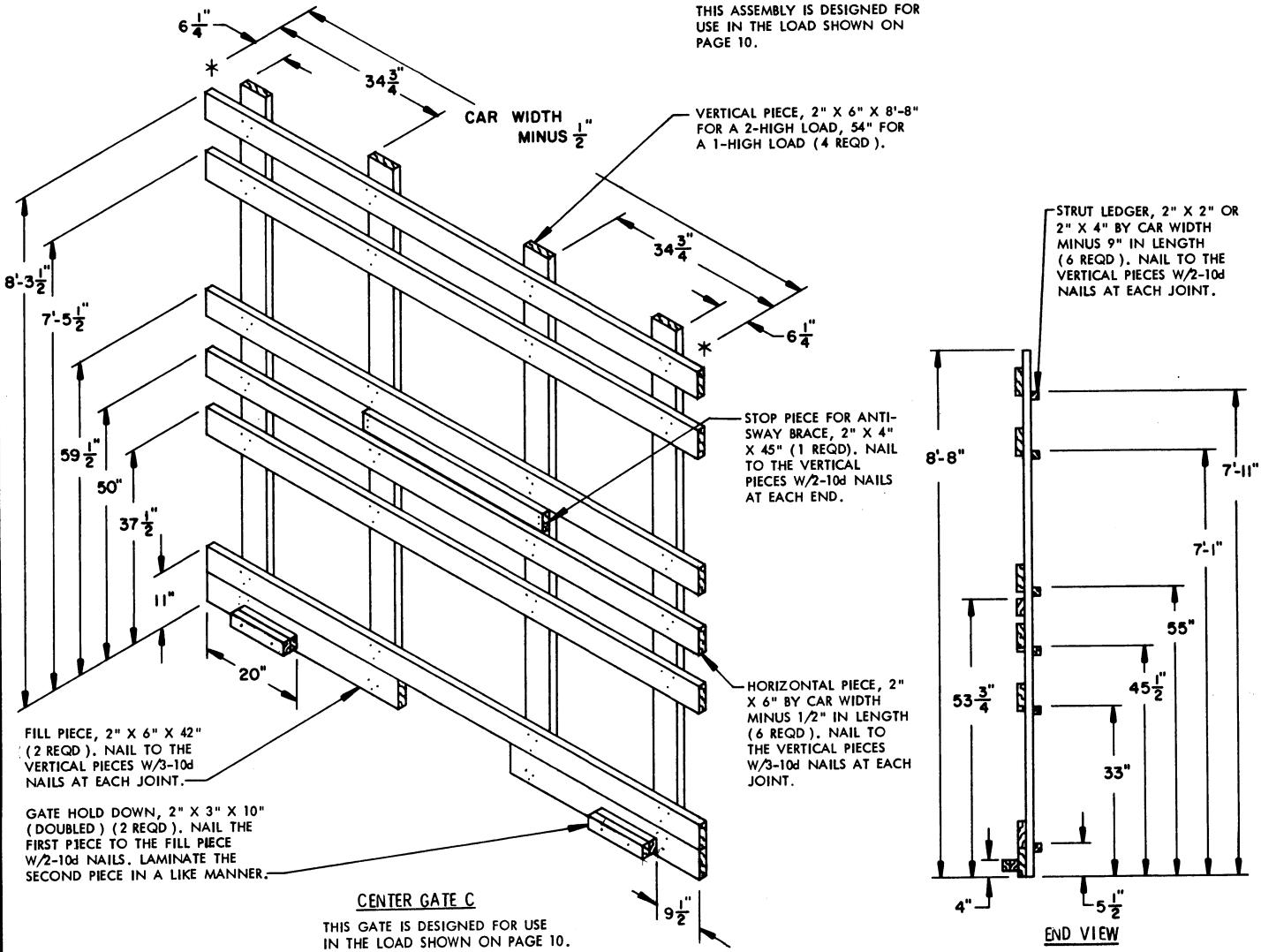
CENTER GATE B
 THIS GATE IS DESIGNED FOR USE IN THE LOAD ON PAGE 8. ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED. SEE SPECIAL NOTE 14 ON PAGE 9.

DETAILS FOR PALLET UNIT (BASIC HEIGHT)



THIS ASSEMBLY IS FOR USE IN THE LOADS ON PAGES 6, 8, AND 14 IF A 9'-2" WIDE CAR IS TO BE LOADED. CRIB FILL "F" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "E" THROUGHOUT THE LENGTH OF THE LOAD.

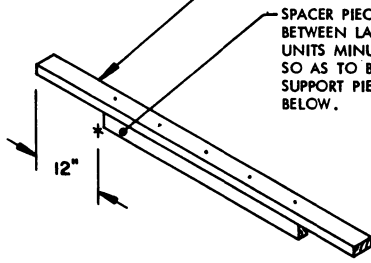
DOORWAY PROTECTION B
THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 10.



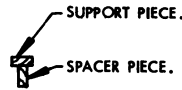
CENTER GATE C
THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 10.

END VIEW

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



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

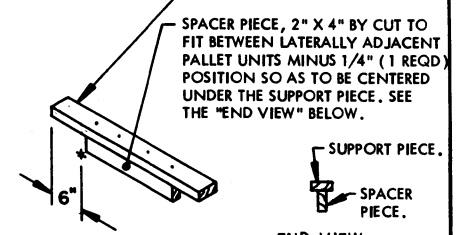


END VIEW

TOP-OF-LOAD ANTI-SWAY BRACE A

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

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



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

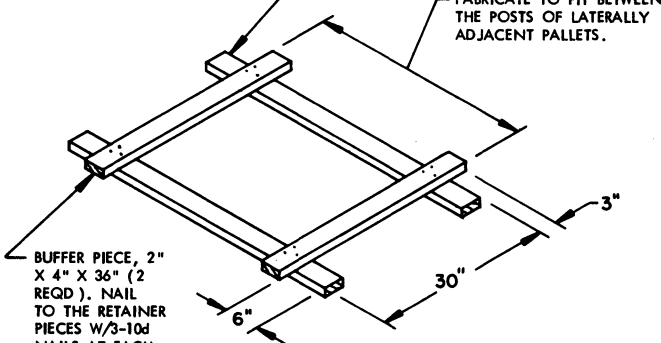


END VIEW

TOP OF LOAD ANTI-SWAY BRACE B

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

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



FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT PALLET.

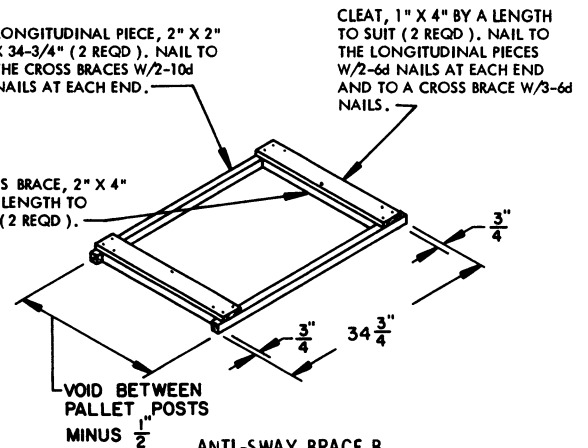
BUFFER PIECE, 2" X 4" X 36" (2 REQD). NAIL TO THE RETAINER PIECES W/3-10d NAILS AT EACH JOINT.

ANTI-SWAY BRACE A

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 8 AND 22. IF DESIRED, THE ANTI-SWAY BRACE CAN BE PARTIALLY PRE-ASSEMBLED; ONE BUFFER PIECE CAN BE NAILED TO BOTH RETAINER PIECES. THE LONG ENDS OF THE ASSEMBLY CAN THEN BE INSTALLED INTO THE FORKLIFT OPENINGS OF A LOADED PALLET PRIOR TO POSITIONING THE LATERALLY ADJACENT PALLET.

LONGITUDINAL PIECE, 2" X 2" X 34-3/4" (2 REQD). NAIL TO THE CROSS BRACES W/2-10d NAILS AT EACH END.

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

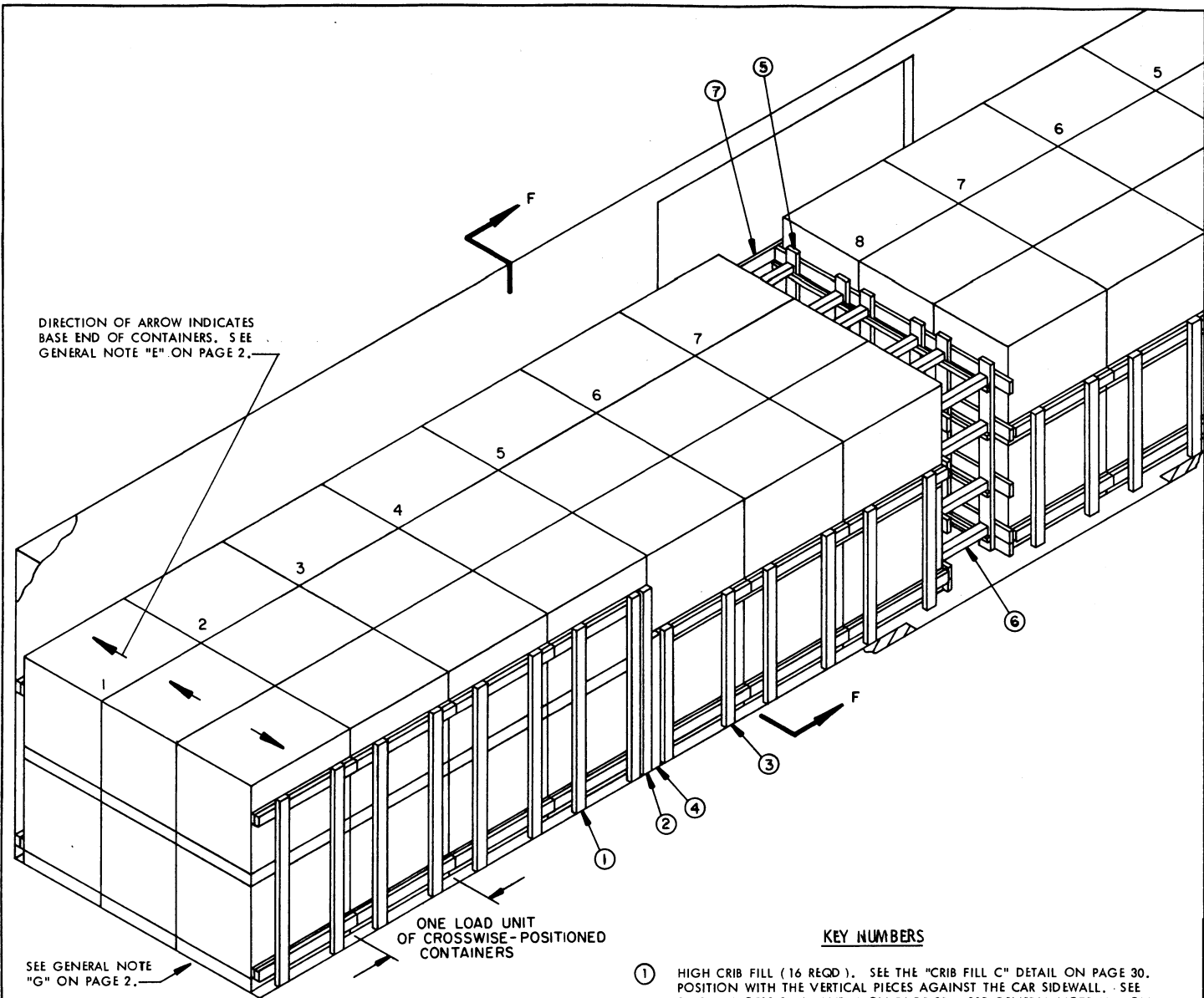


CLEAT, 1" X 4" BY A LENGTH TO SUIT (2 REQD). NAIL TO THE LONGITUDINAL PIECES W/2-6d NAILS AT EACH END AND TO A CROSS BRACE W/3-6d NAILS.

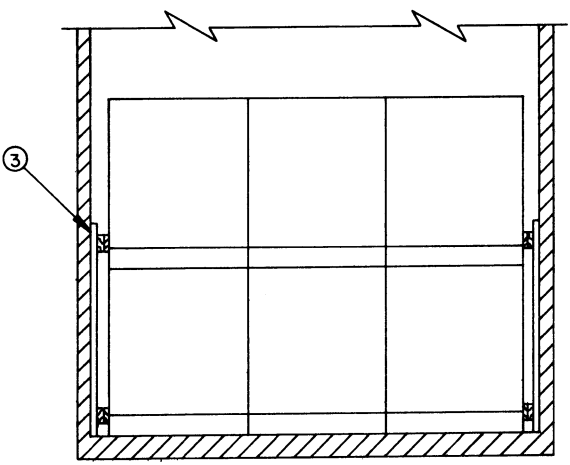
VOID BETWEEN PALLET POSTS MINUS 1/2"

ANTI-SWAY BRACE B

THIS ASSEMBLY IS FOR USE IN THE LOADS SHOWN ON PAGES 10, 12, 24, 26 AND 28.



ISOMETRIC VIEW



SECTION F-F

KEY NUMBERS

- ① HIGH CRIB FILL (16 REQD). SEE THE "CRIB FILL C" DETAIL ON PAGE 30. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL. SEE SPECIAL NOTES 3, 4, AND 6 ON PAGE 21. SEE GENERAL NOTE "M" ON PAGE 2.
- ② HIGH CRIB FILL STOP PIECE, 2" X 4" X 6'-2" (4 REQD). NAIL TO THE END OF THE HORIZONTAL PIECES OF PIECE MARKED ① W/2-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 5 ON PAGE 21.
- ③ LOW CRIB FILL (14 REQD). SEE THE "CRIB FILL D" DETAIL ON PAGE 30. POSITION WITH THE VERTICAL PIECES AGAINST THE CAR SIDEWALL.
- ④ LOW CRIB FILL STOP PIECE, 2" X 4" X 54" (4 REQD). NAIL TO THE END OF THE HORIZONTAL PIECES OF PIECE MARKED ③ W/2-10d NAILS AT EACH JOINT.
- ⑤ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" DETAIL ON PAGE 30. SEE SPECIAL NOTES 7 THRU 10 ON PAGE 21.
- ⑥ STRUT, 4" X 4" BY CUT TO FIT (REF: 24-1/2") (24 REQD). TOENAIL TO PIECES MARKED ⑤ W/2-10d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ⑦ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 32. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 11 ON PAGE 21.

PALLET UNIT (DECREASED HEIGHT)

90-UNIT LOAD IN A 60'-8" LONG BY 9'-6" 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 THE DOORWAY BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 20, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILABLE FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑤ THRU ⑧ ON PAGE 14 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.
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. THE ENTIRE TOP TIER OR JUST THE TOP TIER OF THE MIDDLE ROW OF UNITS CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
13. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
14. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.
15. THE CAR TO BE USED FOR SHIPMENT OF THE DEPICTED 90-UNIT LOAD MUST HAVE A LOAD LIMIT OF AT LEAST 131,900 POUNDS. FOR A 72-UNIT LOAD IN A 50'-6" LONG CAR, A LOAD LIMIT OF AT LEAST 108,900 POUNDS IS REQUIRED IF AN OFFSET LOADING PATTERN IS USED, OR A LOAD LIMIT OF 105,400 POUNDS OR GREATER IF LOADED EVENLY. FOR A 54-UNIT LOAD IN A 40'-6" LONG CAR, A LOAD LIMIT OF AT LEAST 81,000 POUNDS IS REQUIRED.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-10" MINIMUM WIDTH) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE DECREASED HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 20. A MAXIMUM OF SEVENTY-TWO (72) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 103,824 POUNDS, CAN BE PLACED IN A 50'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES FIFTY-FOUR (54) UNITS, FOR A LADING WEIGHT OF 77,868 POUNDS, CAN BE LOADED IN A 40'-6" LONG CAR. SEE SPECIAL NOTE 15.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. EIGHT (8) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 60'-8" LONG CAR; SIX (6) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD IN A 50'-6" OR 40'-6" LONG CAR. NOTE THAT CRIB FILL IS NOT REQUIRED IF THE CAR BEING LOADED IS 9'-0" OR LESS IN WIDTH.
4. IF THE DEPICTED LOAD IS TO BE SHIPPED IN A 9'-2" WIDE CAR, CRIB FILL "G" AND CRIB FILL "H", AS DETAILED ON PAGES 31 AND 32, RESPECTIVELY, WILL BE USED IN LIEU OF PIECES MARKED ① AND ③ ON PAGE 20.
5. CRIB FILL STOP PIECES, PIECES MARKED ② AND ④, ARE REQUIRED TO PREVENT THE HIGH AND LOW CRIB FILL ASSEMBLIES, PIECES MARKED ① AND ③, FROM INTERLOCKING. THESE STOP PIECES ARE ONLY REQUIRED WHERE THE HIGH CRIB AND LOW CRIB ARE ADJACENT TO EACH OTHER. THE CRIB FILL STOP PIECES MUST BE 1" X 4" MATERIAL IN LIEU OF 2" X 4" MATERIAL WHEN LOADING IN A 9'-2" WIDE CAR. AT THE LOCATIONS WHERE CRIB FILL STOP PIECES ARE REQUIRED, OMIT THE 7-1/4" LONG FILL PIECES FROM THE CRIB FILL ASSEMBLIES AND REPLACE WITH THE CRIB FILL STOP PIECES. STOP PIECES WILL BE APPLIED AT THE ENDS OF THE HORIZONTAL PIECES. NAIL W/3-6d NAILS AT EACH JOINT AND CLINCH. NOTE THAT 2" X 4" STOP PIECES AS SPECIFIED IN KEY NUMBERS ② AND ④ ARE ADEQUATE FOR A 9'-4" WIDE CAR.
6. IF THE CAR FURNISHED FOR LOADING HAS WOOD-LINED SIDEWALLS, AND IF DESIRED, FILL MATERIAL MAY BE NAILED TO THE SIDEWALL IN LIEU OF USING THE HIGH AND LOW CRIB FILL AND THE CRIB FILL STOP PIECES, PIECES MARKED ① THRU ④. MATERIAL THICKNESS WILL BE 2" X 4" FOR A 9'-2" WIDE CAR, DOUBLED 2" X 4" FOR A 9'-4" CAR, AND DOUBLED 2" X 4" PLUS A 1" X 4" FOR A 9'-6" WIDE CAR. INSTALL ON BOTH SIDES OF THE CAR AT THE HEIGHTS SPECIFIED FOR THE HORIZONTAL PIECES OF THE HIGH CRIB FILL ASSEMBLIES AND OF A LENGTH TO CONTACT ALL PALLET UNITS EXCEPT THOSE WHICH EXTEND INTO THE DOOR OPENING. RANDOM LENGTH MATERIAL MAY BE USED. NAIL 1" X 4" FILL W/1-6d NAIL EVERY 24". CRIB FILL ASSEMBLIES MUST BE USED FOR THOSE LOAD UNITS WHICH EXTEND INTO THE DOOR OPENING UNLESS THE PLUG DOOR TYPE DOORWAY PROTECTION IS USED. IN THAT CASE, THE NAILED FILL MATERIAL MUST EXTEND TO THE DOOR OPENING AND THE CRIB FILL ASSEMBLIES WILL NOT BE REQUIRED.
7. CENTER GATE "D", PIECE MARKED ⑤, WILL BE BUILT 9'-1-1/2" WIDE FOR CARS WHICH ARE 9'-2" OR GREATER IN WIDTH. THE GATES WILL BE CONSTRUCTED TO BE CAR WIDTH MINUS ONE-HALF INCH IN WIDTH FOR CARS LESS THAN 9'-2" WIDE, AND WILL HAVE THE VERTICAL PIECES PLACED AT 5-1/4" AND 27-1/2" FROM EACH END AND AT 40-1/4" AND 62-1/2" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS GIVEN ON THE CENTER GATE DETAIL.
8. CENTER GATE "D" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE A" DETAIL ON PAGE 67 FOR GUIDANCE.
9. FOR EASE OF HANDLING, SPLIT CENTER GATES MAY BE USED AS AN ALTERNATIVE TO THE DEPICTED GATES. IN LIEU OF EACH "CENTER GATE D", SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 20, INSTALL TWO (2) "CENTER GATE J" AND TWO (2) "CENTER GATES K" AS DETAILED ON PAGE 64. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
10. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "D", PROVIDING THE CAR BEING LOADED IS 9'-2" OR LESS IN WIDTH AND ALSO PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 69 FOR GUIDANCE.

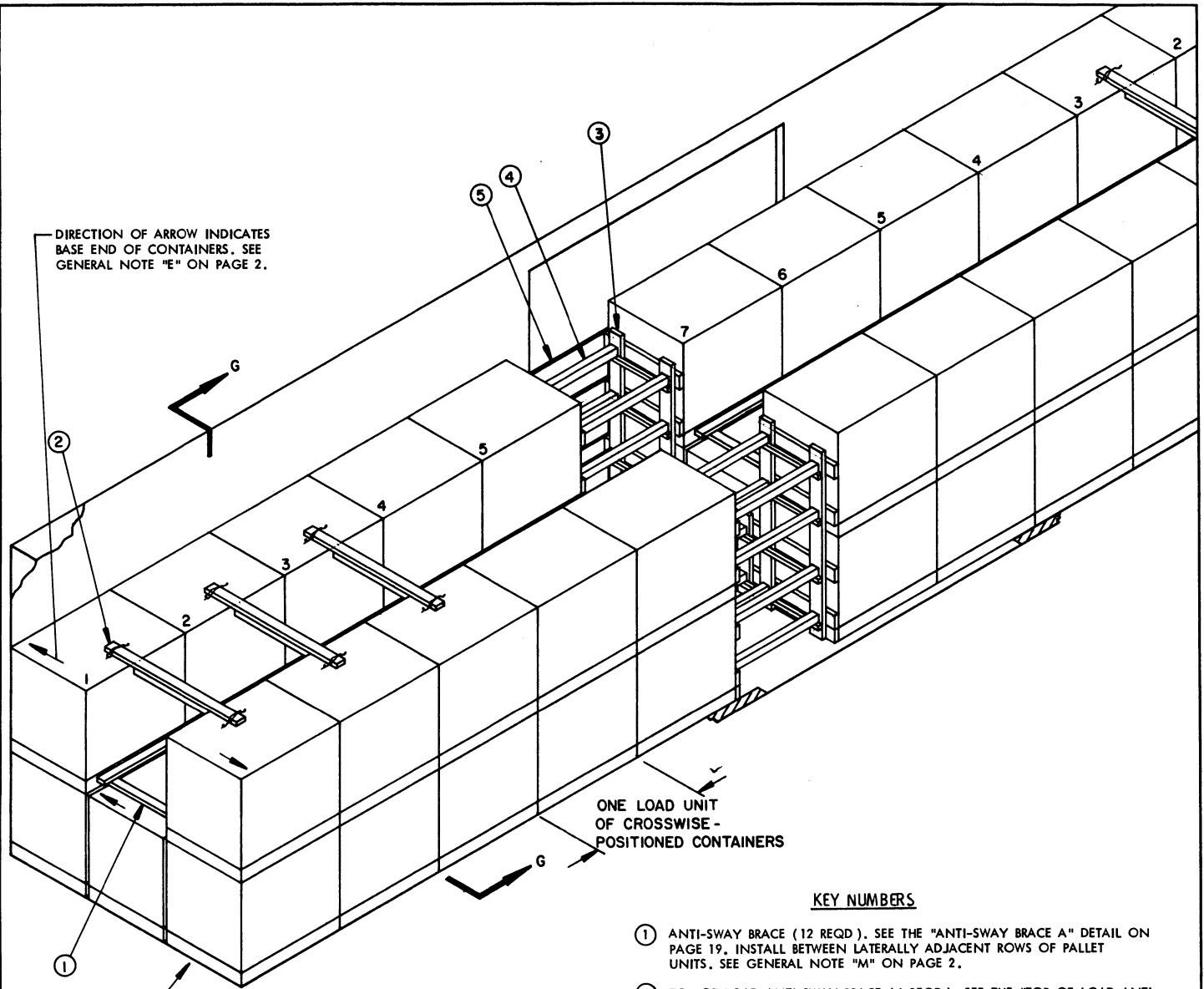
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BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	234	78
1" X 6"	80	40
2" X 2"	69	23
2" X 3"	28	14
2" X 4"	606	404
2" X 6"	161	161
4" X 4"	49	66
NAILS	NO. REQD	POUNDS
6d (2")	288	1-3/4
10d (3")	672	10-1/2
12d (3-1/4")	28	1/2
16d (3-1/2")	96	2-1/4

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	90	129,780 LBS
DUNNAGE		1,588 LBS
TOTAL WEIGHT		131,368 LBS

PALLET UNIT (DECREASED HEIGHT)
90-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE CONVENTIONAL BOX CAR



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

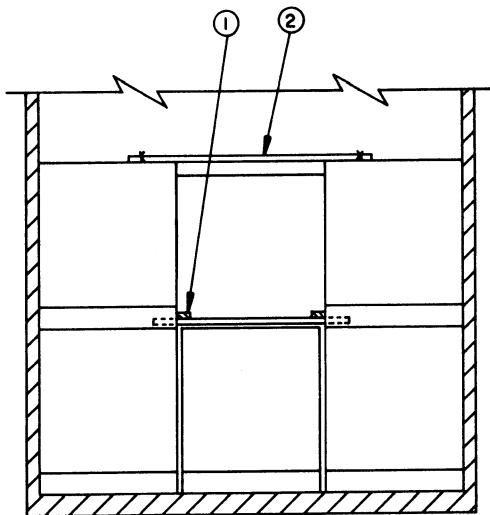
ONE LOAD UNIT
OF CROSSWISE-
POSITIONED CONTAINERS

SEE GENERAL NOTE
"G" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (12 REQD). SEE THE "ANTI-SWAY BRACE A" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECE OF TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 64. SEE SPECIAL NOTE 5 ON PAGE 23.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE E" DETAIL ON PAGE 31. SEE SPECIAL NOTES 6 THRU 8 AND 13 ON PAGE 23.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 42") (20 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U" AND "V" ON PAGE 2 AND/OR 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION D" DETAIL ON PAGE 32. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 9 ON PAGE 23.



SECTION G-G

PALLET UNIT (DECREASED HEIGHT)
60-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL BOX CAR

(SPECIAL NOTES CONTINUED)

- 10. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. THE LOAD CAN BE REDUCED BY A MULTIPLE OF FIVE (5) PALLET UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. THE ENTIRE TOP TIER CAN BE OMITTED, AND MULTIPLES OF THREE (3) PALLET UNITS CAN BE OMITTED FROM A ONE-LAYER LOAD. OR, THE CENTER ROW OF THE BOTTOM LAYER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
- 11. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
- 12. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.
- 13. CENTER GATE "E", PIECE MARKED ③, WILL BE BUILT TO BE CAR WIDTH MINUS 1/2" FOR CARS WHICH ARE LESS THAN 9'-2" WIDE; RIGHT HAND AND LEFT HAND GATES WILL THEN BE REQUIRED. THE GATES WILL BE CONSTRUCTED 9'-1 1/2" FOR CARS 9'-2" AND WIDER, AND WILL HAVE THE VERTICAL PIECES PLACED AT 7'-3/4" AND 30" FROM EACH END AND AT 42'-3/4" AND 65" FROM ONE END FOR THE CENTER ROW OF UNITS IN LIEU OF THE DIMENSIONS SHOWN ON THE CENTER GATE DETAIL. BOTH GATES WILL BE MADE ALIKE FOR CARS 9'-2" AND WIDER.

SPECIAL NOTES:

- 1. A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS (8'-10" MINIMUM) AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED. SEE SPECIAL NOTE 3 BELOW.
- 2. THE DECREASED HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 22. A MAXIMUM OF FORTY-FIVE (45) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 64,890 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES; IF A 60'-8" LONG CAR IS AVAILABLE, SEVENTY (70) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 100,940 POUNDS OR PERHAPS SEVENTY-FIVE (75) UNITS FOR AN APPROXIMATE WEIGHT OF 108,150 POUNDS CAN BE PLACED. IF THE LOAD LIMIT OF THE CAR PERMITS, SIX (6) PALLET UNITS CAN BE PLACED WITHIN EACH LOAD UNIT. SEE THE PROCEDURES ON PAGES 20 AND 21 FOR GUIDANCE.
- 3. THE DEPICTED LOADING PATTERN IS ADEQUATE FOR CARS HAVING DOOR OPENINGS 8' THRU 10' OR WIDER. IF THE CAR TO BE LOADED HAS DOOR OPENINGS LESS THAN 8'-0" WIDE AND NOT OF SUFFICIENT HEIGHT TO ALLOW PERSONNEL TO EXIT THE CAR OVER THE TOP OF THE LOAD, THE PALLETS SHOULD BE POSITIONED SO THERE ARE SIX (6) LOAD UNITS IN EACH END. NOTE THAT ALTHOUGH CARS HAVING DOOR OPENINGS AS NARROW AS 6'-0" WIDE CAN BE USED FOR FULL LOADS, LOADING IS PROGRESSIVELY MORE DIFFICULT AS THE WIDTH OF THE DOOR OPENING DECREASES.
- 4. IF THE CAR FURNISHED FOR LOADING IS WIDER THAN 9'-0", CRIB FILL MUST BE INSTALLED BETWEEN THE PALLET UNITS AND THE CAR SIDEWALL ON BOTH SIDES OF THE LOAD. SEE THE "CRIB FILL C" AND "CRIB FILL D" DETAILS ON PAGE 30 AND THE TYPICAL INSTALLATION SHOWN BY PIECES MARKED 1 THRU 4 ON PAGE 20.
- 5. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 22, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION A" DETAIL ON PAGE 63. THREE (3) BRACES ARE REQUIRED IN EACH END OF THE LOAD IN 40 OR 50 FOOT CARS; FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN A 60 FOOT CAR.
- 6. CENTER GATE "E" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE B" DETAIL ON PAGE 67 FOR GUIDANCE.
- 7. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR WIDTH GATES. IN LIEU OF EACH "CENTER GATE E", SHOWN AS PIECE MARKED ③ IN THE LOAD ON PAGE 22, INSTALL TWO (2) "CENTER GATES J" AND TWO (2) "CENTER GATES K" AS SHOWN ON PAGE 64. NOTE THAT THE "CENTER GATES K" MUST BE MODIFIED FOR USE WITH THREE PALLET UNITS IN LIEU OF FOUR. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
- 8. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO THE CENTER GATE "E", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 69 FOR GUIDANCE. THIS TYPE GATE HOLD DOWN NOT APPLICABLE FOR CARS WIDER THAN 9'-2".
- 9. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ⑤ IN THE LOAD ON PAGE 22, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED ⑥ THRU ⑧ ON PAGE 14 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION STRAP WILL BE 34'-6" LONG IN LIEU OF 36'-0" LONG. ALSO NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.

BILL OF MATERIAL

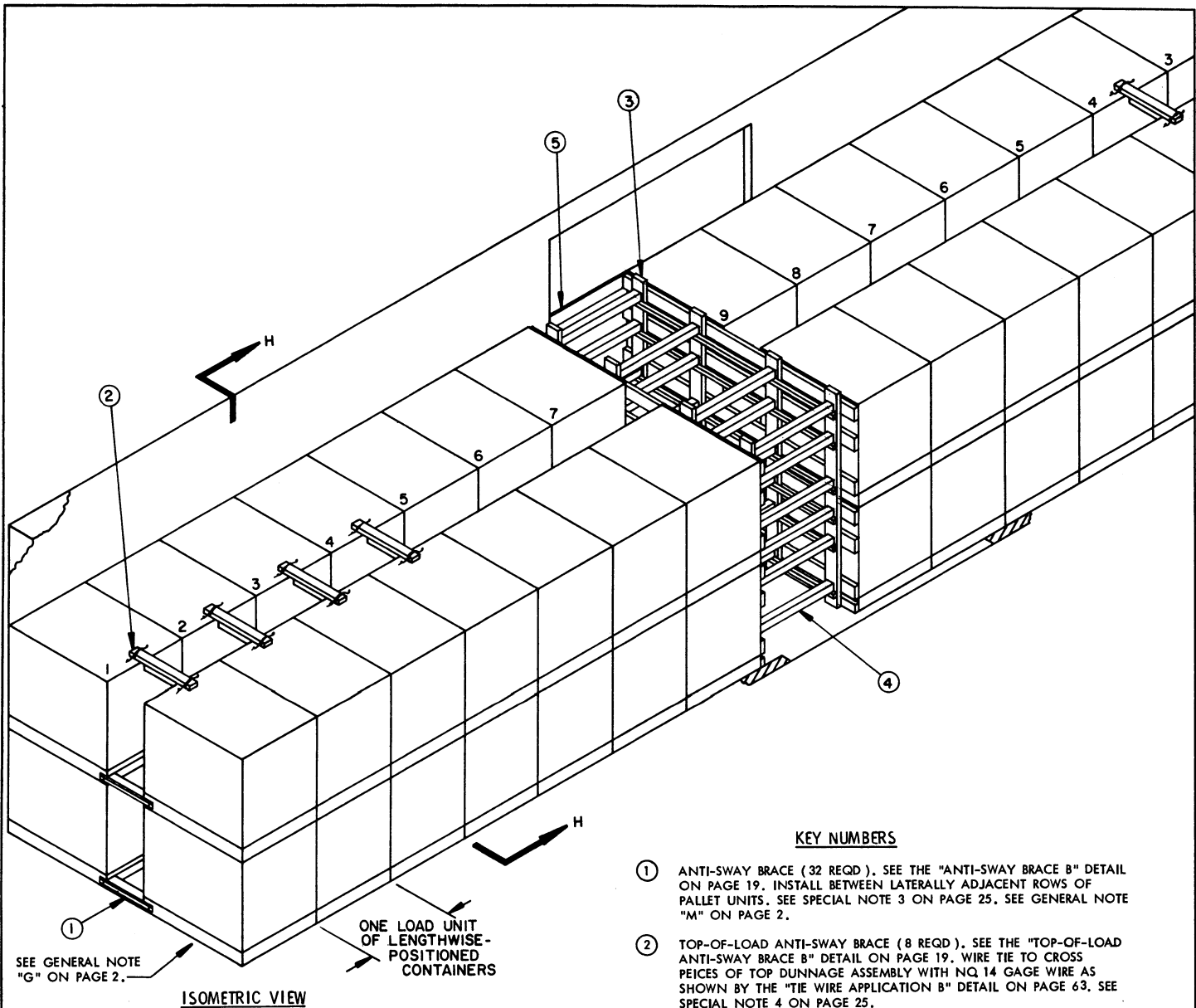
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	54	18
2" X 3"	28	14
2" X 4"	228	152
2" X 6"	133	133
4" X 4"	70	94
NAILS	NO. REQD	POUNDS
6d (2")	48	1/2
10d (3")	384	6
12d (3-1/4")	58	1
16d (3-1/2")	80	1-3/4
WIRE, NO. 14 GAGE ----- 60' REQD ----- 1 LB		

(CONTINUED AT LEFT)

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	60 -----	86,520 LBS
DUNNAGE -----	-----	913 LBS
TOTAL WEIGHT -----		87,433 LBS

PALLET UNIT (DECREASED HEIGHT)
60-UNIT LOAD IN A 50'-6" LONG BY 9'-0" WIDE CONVENTIONAL BOX CAR



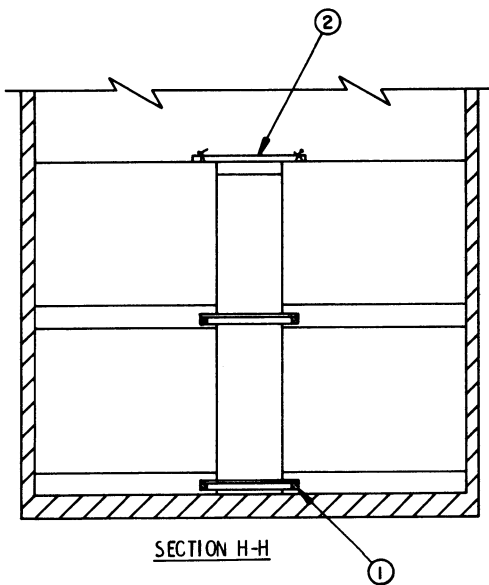
ISOMETRIC VIEW

SEE GENERAL NOTE "G" ON PAGE 2.

ONE LOAD UNIT OF LENGTHWISE-POSITIONED CONTAINERS

KEY NUMBERS

- ① ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE SPECIAL NOTE 3 ON PAGE 25. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PEICES OF TOP DUNNAGE ASSEMBLY WITH NQ 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. SEE SPECIAL NOTE 4 ON PAGE 25.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE F" DETAIL ON PAGE 32. SEE SPECIAL NOTES 5 THRU 7 ON PAGE 25.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 40") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION C" DETAIL ON PAGE 31. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 8 ON PAGE 25.



SECTION H-H

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 8'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE DECREASED HEIGHT PALLET UNIT IS SHOWN IN THE LOAD ON PAGE 24. A MAXIMUM OF FIFTY-TWO (52) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 74,984 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES. IF A 60'-8" LONG CAR IS AVAILABLE, SEVENTY-SIX (76) PALLET UNITS FOR AN APPROXIMATE LADING WEIGHT OF 109,592 POUNDS OR EIGHTY (80) UNITS FOR APPROXIMATELY 115,360 POUNDS, CAN BE LOADED.
3. IF THE ALTERNATIVE DOORWAY PROTECTION PROCEDURES AS SHOWN ON PAGE 28 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF EACH LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR. SEE SPECIAL NOTE 8 BELOW.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 24, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD FOR 40' AND 50' CARS. NOTE THAT FIVE (5) BRACES WILL BE REQUIRED IN EACH END OF A LOAD FOR 60' CARS.
5. 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 C" DETAIL ON PAGE 67 FOR GUIDANCE.
6. FOR EASE OF HANDLING, SPLIT CENTER GATES, WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE TO THE CAR-WIDTH GATES. IN LIEU OF EACH "CENTER GATE F", SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 24, INSTALL TWO (2) "CENTER GATES L" AS DETAILED ON PAGE 65. AFTER THE SPLIT GATES AND STRUTS HAVE BEEN INSTALLED, THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED BY THE "TYPICAL TIE PIECE APPLICATION" DETAIL ON PAGE 65.
7. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 3" MATERIAL NAILED TO CENTER GATE "F", PROVIDING THE CAR BEING LOADED HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 69 FOR GUIDANCE.
8. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 24, IS APPLICABLE FOR BOX CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 70 THRU 72 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS, NAILED FLOORLINE BLOCKING AND DOORWAY PROTECTION STRAPS MUST BE USED. SEE PIECES MARKED (3) THRU (6) ON PAGE 28 FOR GUIDANCE. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR CARS EQUIPPED WITH PLUG DOORS MAY ALSO BE USED FOR CARS EQUIPPED WITH SLIDING DOORS.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	130	44
1" X 6"	64	32
2" X 2"	296	99
2" X 3"	35	18
2" X 4"	152	102
2" X 6"	184	184
4" X 4"	80	107
NAILS	NO. REQD	POUNDS
6d (2")	496	3
10d (3")	544	8-1/2
12d (3-1/4")	60	1
16d (3-1/2")	90	2
WIRE, NO. 14 GAGE ----- 90' REQD ----- 2 LBS		

LOAD AS SHOWN

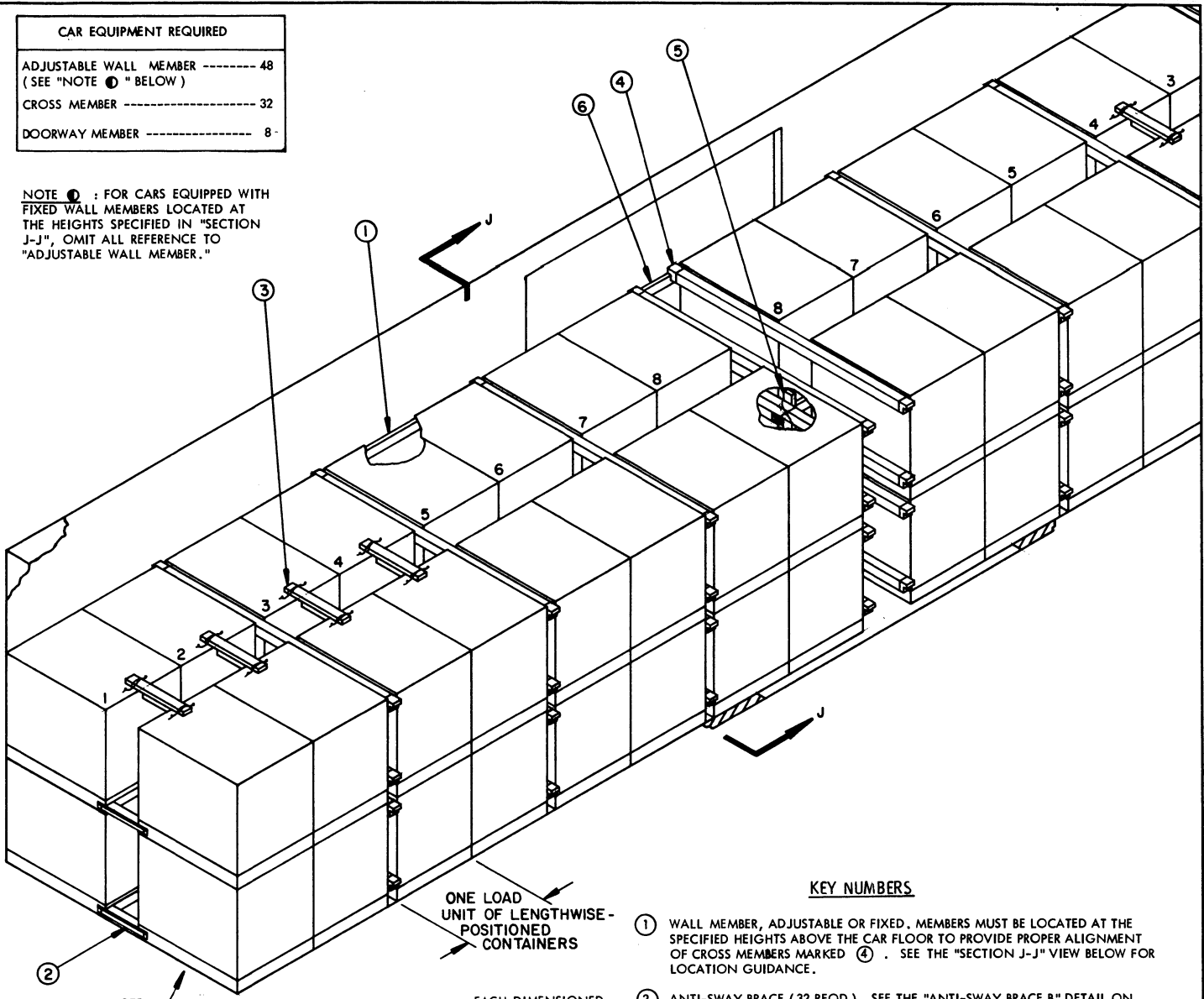
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	64	92,288 LBS
DUNNAGE -----		1,189 LBS
TOTAL WEIGHT -----		93,477 LBS

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

CAR EQUIPMENT REQUIRED

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

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



ISOMETRIC VIEW

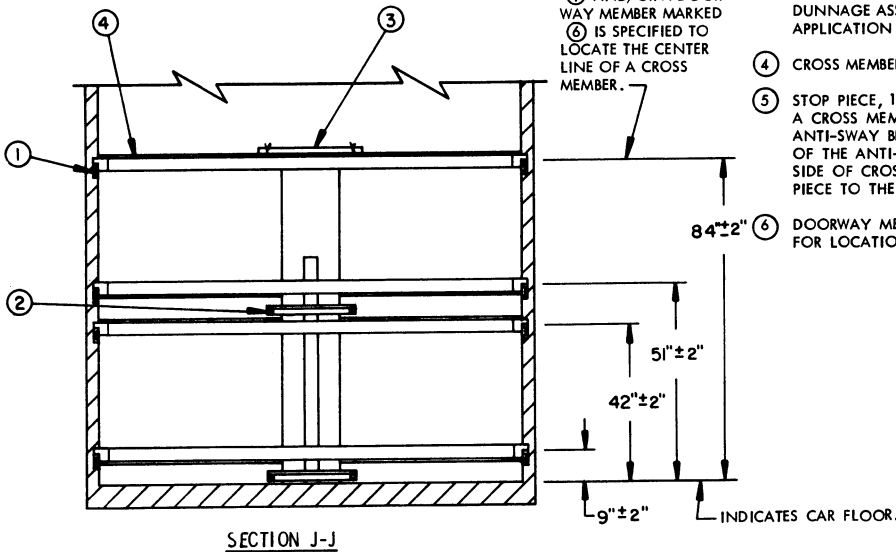
SEE GENERAL NOTE "G" ON PAGE 2, AND SPECIAL NOTE 3 ON PAGE 27.

ONE LOAD UNIT OF LENGTHWISE-POSITIONED CONTAINERS

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.

KEY NUMBERS

- 1 WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED 4. SEE THE "SECTION J-J" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (32 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (8 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. SEE SPECIAL NOTE 4 ON PAGE 27.
- 4 CROSS MEMBER (32 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- 5 STOP PIECE, 1" X 4" X 58" (2 REQD). INSTALL AT EACH LOAD SIDE OF A CROSS MEMBER BLOCKING STATION TO PREVENT DISPLACEMENT OF ANTI-SWAY BRACES, PIECE MARKED 2. NAIL TO THE CROSS PIECE OF THE ANTI-SWAY BRACES W/2-6d NAILS AT EACH JOINT. ON NEAR SIDE OF CROSS MEMBERS, WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO THE ADJACENT CROSS MEMBER WITH NO. 14 GAGE WIRE.
- 6 DOORWAY MEMBER (8 REQD). SEE THE "SECTION J-J" VIEW AT LEFT FOR LOCATION GUIDANCE.



SECTION J-J

PALLET UNIT (DECREASED HEIGHT)

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

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS, AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE DECREASED HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 26. A MAXIMUM OF FORTY-EIGHT (48) OF THESE UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 69,216 POUNDS CAN BE PLACED IN A 40'-6" LONG CAR.
3. IF A CAR HAS BOWED ENDWALLS 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 TO PROVIDE A "SQUARE END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "G" ON PAGE 2. THESE CROSS MEMBERS SHOULD BE INSTALLED AT THE SAME HEIGHTS AS THE CROSS MEMBERS USED THROUGHOUT THE LOAD AS BLOCKING MEMBERS.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③ IN THE LOAD ON PAGE 26, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40' AND 50' CARS.
5. STOP PIECES, SHOWN AS PIECES MARKED ⑤ IN THE LOAD ON PAGE 26, ARE REQUIRED TO PREVENT THE ANTI-SWAY BRACES, PIECE MARKED ②, FROM MOVING INTO THE VOID AREA FORMED BY THE CROSS MEMBERS AND/OR THE VOID AT THE CENTER OF THE CAR. SECUREMENT OF THE STOP PIECE IS EXPLAINED WITHIN KEY NUMBER ⑤ ON PAGE 26.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 34 AND 35 FOR GUIDANCE.
7. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.

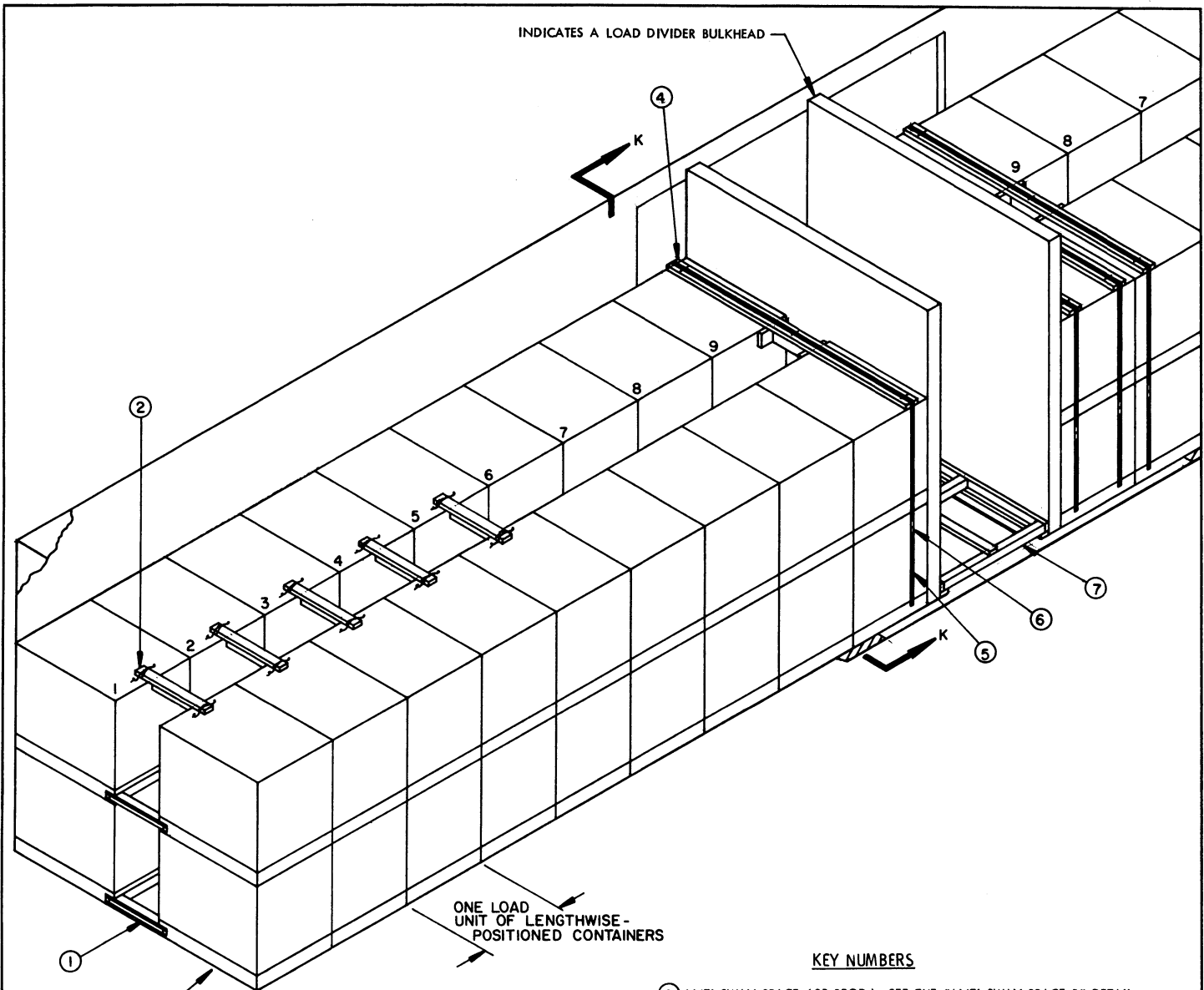
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	129	40
2" X 2"	186	62
2" X 4"	123	82
NAILS	NO. REQD	POUNDS
6d (2")	464	2-3/4
10d (3")	256	4
12d (3-1/4")	32	3/4
WIRE, NO. 14 GAGE ----- 90' REQD ----- 2 LBS		

LOAD AS SHOWN

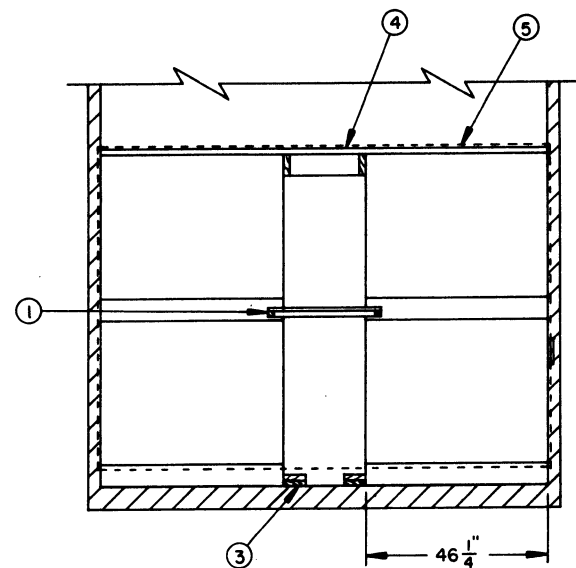
ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	64 -----	92,288 LBS
DUNNAGE -----		378 LBS
TOTAL WEIGHT -----		92,666 LBS

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



SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW



SECTION K-K

PALLET UNIT (DECREASED HEIGHT)

76-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS

KEY NUMBERS

- ① ANTI-SWAY BRACE (35 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (10 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. SEE SPECIAL NOTE 4 ON PAGE 29.
- ③ SIDE BLOCKING, 2" X 6" X 35" (DOUBLED) (6 REQD, 2 REQD FOR EACH UNIT REQUIRING 1 OR 2 BUNDLING STRAPS), POSITION AGAINST THE PALLETS IN THE DOORWAY AREA AS SHOWN IN "SECTION K-K" VIEW BELOW. NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 29.
- ④ SPACER ASSEMBLY (4 REQD). SEE THE "SPACER ASSEMBLY B" DETAIL ON PAGE 33.
- ⑤ DOORWAY PROTECTION STRAP, 1-1/4" X .031" OR .035" X 34'-6" LONG STEEL STRAPPING (4 REQD). INSTALL TO ENIRCLE THE LOAD UNITS IN THE DOORWAY AREA. STAPLE STRAP TO SPACER ASSEMBLY W/3 STAPLES. SEE SPECIAL NOTE 6 ON PAGE 29.
- ⑥ SEALS FOR 1-1/4" STEEL STRAPPING (8 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑦ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 73. INSTALL BETWEEN THE LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 7 ON PAGE 29.

SPECIAL NOTES:

1. A 60'-8" LONG BY 9'-6" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND 12'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED. SEE GENERAL NOTES "AA" THRU "EE" ON PAGE 3.
2. THE DECREASED HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LOAD ON PAGE 28. A MAXIMUM OF SIXTY-FOUR (64) OF THESE UNITS FOR AN APPROXIMATE LADING WEIGHT OF 92,288 POUNDS CAN BE PLACED IN A 50'-6" LONG CAR, OR A MAXIMUM OF FORTY-EIGHT (48) UNITS CAN BE LOADED IN A 40'-6" CAR FOR AN APPROXIMATE LADING WEIGHT OF 69,216 POUNDS, WHEN USING THE DEPICTED PROCEDURES. IF DESIRED, PALLET UNITS CAN BE LOADED WITH THE CONTAINERS ON THE UNIT CROSSWISE IN LIEU OF LENGTHWISE AS SHOWN. THEN EIGHTY-FOUR (84) UNITS CAN BE LOADED IN A 60'-8" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 121,128 POUNDS, SEVENTY-TWO (72) UNITS CAN BE PLACED IN A 50'-6" LONG CAR FOR A LADING WEIGHT OF APPROXIMATELY 103,824 POUNDS, OR FIFTY-FOUR (54) CAN BE LOADED IN A 40'-6" LONG CAR FOR A LOAD OF APPROXIMATELY 77,868 POUNDS. SEE SPECIAL NOTE 8 FOR LADING GUIDANCE FOR USE WHEN THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS CROSSWISE IN THE CAR.
3. THE ALTERNATIVE DOORWAY PROCEDURES FOR PLUG TYPE DOORS IS SHOWN ON PAGE 28, IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION PIECE MARKED ⑤ ON PAGE 24. NAILED FLOORLINE BLOCKING IS USED IN LIEU OF THE LOWER ANTI-SWAY BRACES IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH ON EITHER SIDE OF THE CAR.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ② IN THE LOAD ON PAGE 28, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD IN 40 OR 50 FOOT CARS.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK LENGTH. THE NAILED FLOORLINE BLOCKING AND BUNDLING STRAP PROCEDURE OF DOORWAY PROTECTION, SHOWN AS PIECES MARKED ③ THRU ⑥ IN THE LOAD ON PAGE 28, IS APPLICABLE FOR BOX CARS EQUIPPED WITH PLUG TYPE DOORS OR COMBINATION PLUG AND SLIDING DOORS. NOTE THAT THE DOORWAY PROTECTION PROCEDURES FOR PLUG DOOR CARS CAN ALSO BE USED IN CARS EQUIPPED WITH SLIDING DOORS.
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 CAR SIDEWALL ON BOTH SIDES OF THE CAR. ONE (1) BUNDLING STRAP IS REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS RETAINED BY FROM SIX INCHES (6") TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.
7. THE STRUT ASSEMBLY, SHOWN AS PIECE MARKED ⑦ IN THE LOAD ON PAGE 28, IS REQUIRED WHEN THE LOAD IN EITHER END OF A CAR IS 50,000 POUNDS OR MORE. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN 60' OR LONGER CARS.
8. WHEN PALLET UNITS ARE LOADED WITH THE CONTAINERS CROSSWISE IN THE CAR, THE BLOCKING AND BRACING DUNNAGE WILL BE DIFFERENT THAN THAT SHOWN. CRIB FILL ASSEMBLIES WILL BE REQUIRED IN BOTH ENDS OF THE CAR AS SHOWN BY PIECES MARKED ① THRU ④ ON PAGE 20. DOORWAY PROTECTION, IF THE CAR IS EQUIPPED WITH PLUG DOORS, WILL BE AS SHOWN BY PIECES MARKED ⑤ THRU ⑥ ON PAGE 14.
9. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) PALLET UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 36 THRU 62 AND GENERAL NOTE "FF" ON PAGE 3 FOR GUIDANCE.
10. IF PALLET UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS ARE TO BE TRANSPORTED, REFER TO PAGE 62 FOR SHIPPING GUIDANCE.
11. FOR SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGE 61 FOR GUIDANCE.

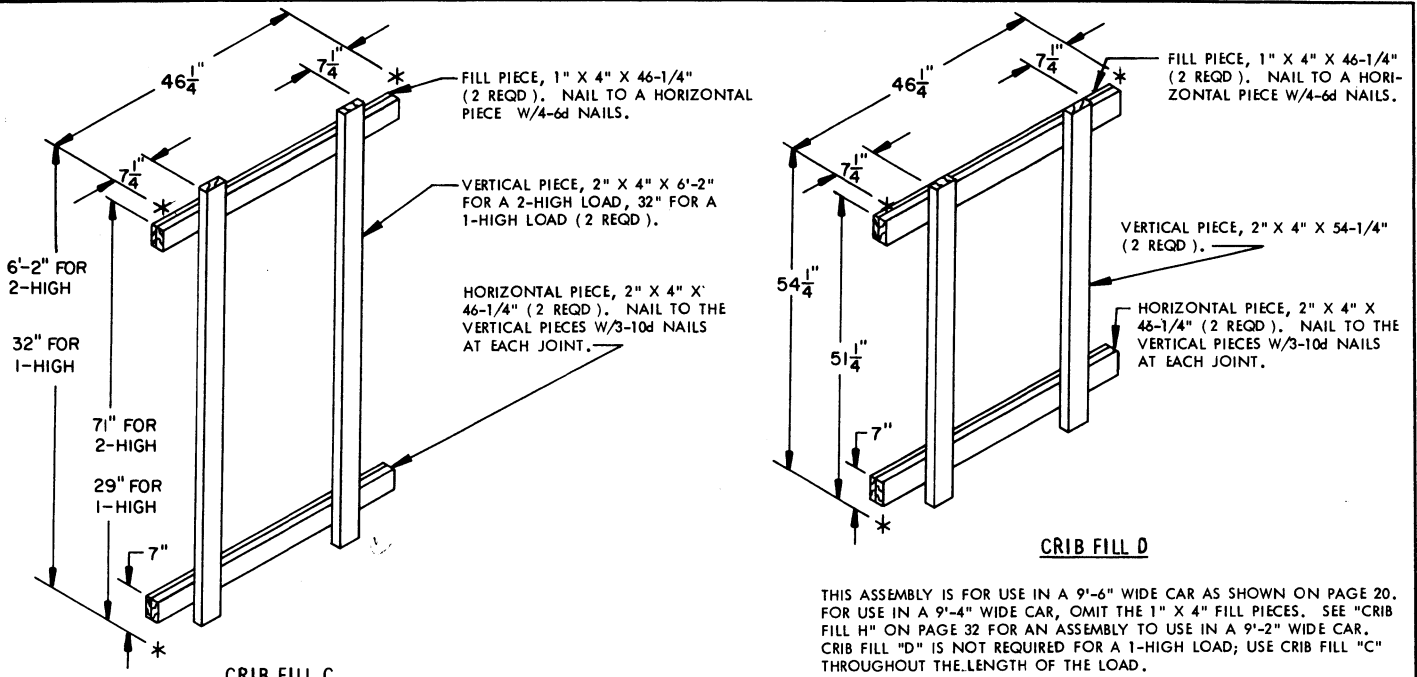
BILL OF MATERIAL

LUMBER	LINEAR FEET	BOARD FEET
1" X 4"	163	55
1" X 8"	17	12
2" X 2"	203	68
2" X 4"	245	164
2" X 6"	87	87
4" X 4"	16	22
NAILS	NO. REQD	POUNDS
6d (2")	508	3
10d (3")	298	4-3/4
12d (3-1/4")	108	2
16d (3-1/2")	60	1-1/2
STEEL STRAPPING, 1-1/4" X .031" OR .035" -- 138' REQD		20 LBS
SEALS FOR 1-1/4" STRAPPING	8 REQD	NIL
STAPLES FOR 1-1/4" STRAPPING	12 REQD	NIL
WIRE, NO. 14 GAGE	115' REQD	2 LBS

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	76	109,592 LBS
DUNNAGE		850 LBS
TOTAL WEIGHT		110,442 LBS

**PALLET UNIT (DECREASED HEIGHT)
76-UNIT LOAD IN A 60'-8" LONG BY 9'-6" WIDE BOX CAR EQUIPPED WITH LOAD DIVIDERS**

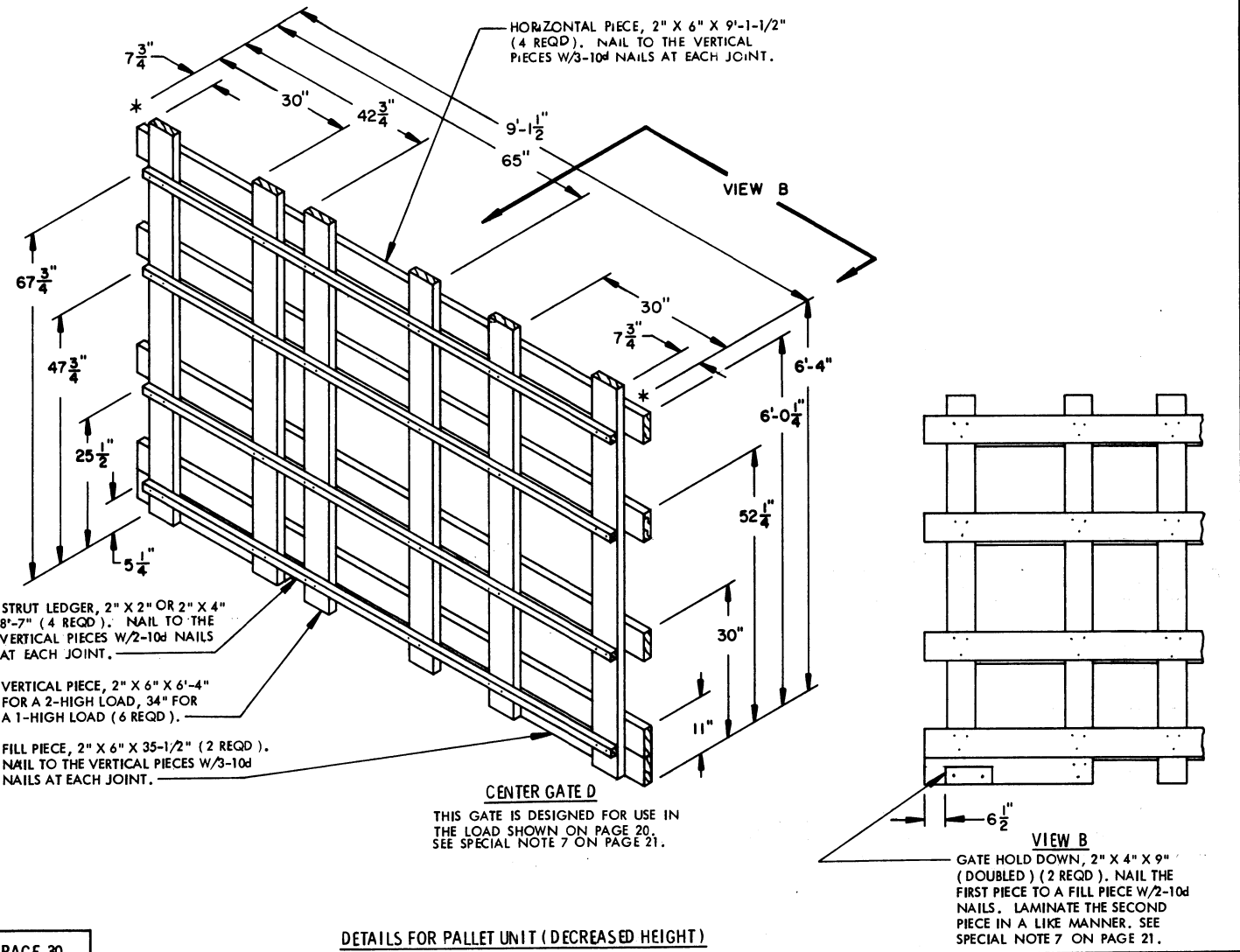


CRIB FILL C

CRIB FILL D

THIS ASSEMBLY IS FOR USE IN A 9'-6" WIDE CAR AS SHOWN ON PAGE 20. FOR USE IN A 9'-4" WIDE CAR, OMIT THE 1" X 4" FILL PIECES. SEE "CRIB FILL H" ON PAGE 32 FOR AN ASSEMBLY TO USE IN A 9'-2" WIDE CAR. CRIB FILL "D" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "C" THROUGHOUT THE LENGTH OF THE LOAD.

THIS ASSEMBLY IS FOR USE IN A 9'-6" WIDE CAR AS SHOWN ON PAGE 20. FOR USE IN A 9'-4" WIDE CAR, OMIT THE 1" X 4" FILL PIECES. SEE "CRIB FILL G" ON PAGE 31 FOR AN ASSEMBLY TO USE IN A 9'-2" WIDE CAR.



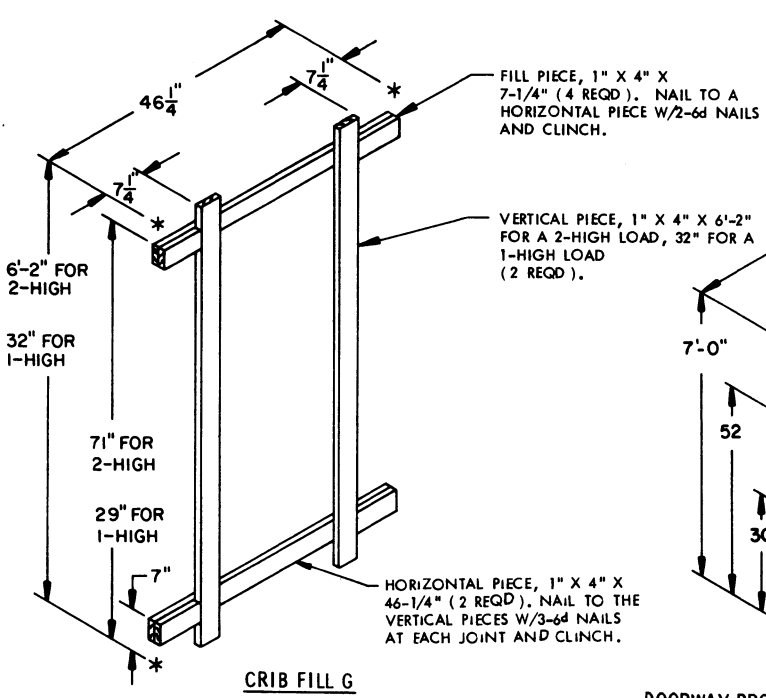
CENTER GATE D

THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 20. SEE SPECIAL NOTE 7 ON PAGE 21.

VIEW B

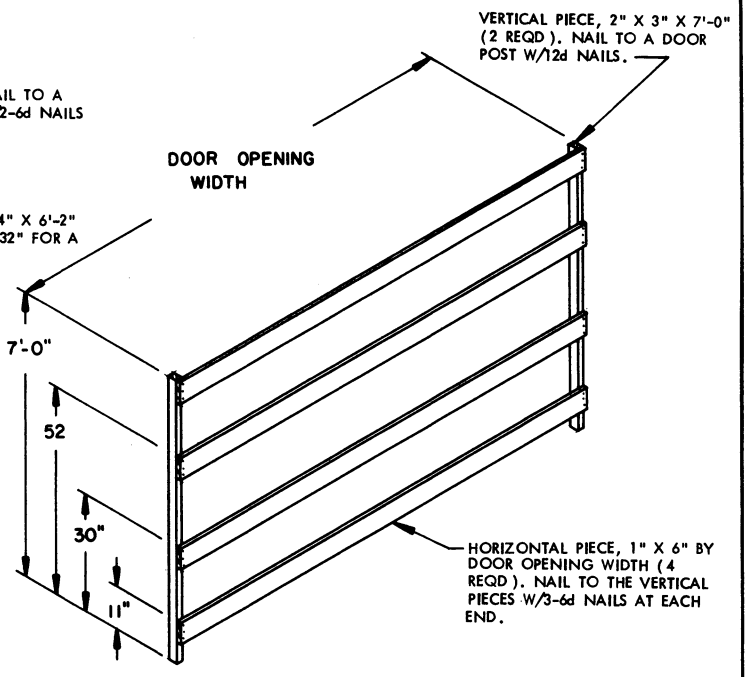
GATE HOLD DOWN, 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO A FILL PIECE W/2-10d NAILS. LAMINATE THE SECOND PIECE IN A LIKE MANNER. SEE SPECIAL NOTE 7 ON PAGE 21.

DETAILS FOR PALLET UNIT (DECREASED HEIGHT)



CRIB FILL G

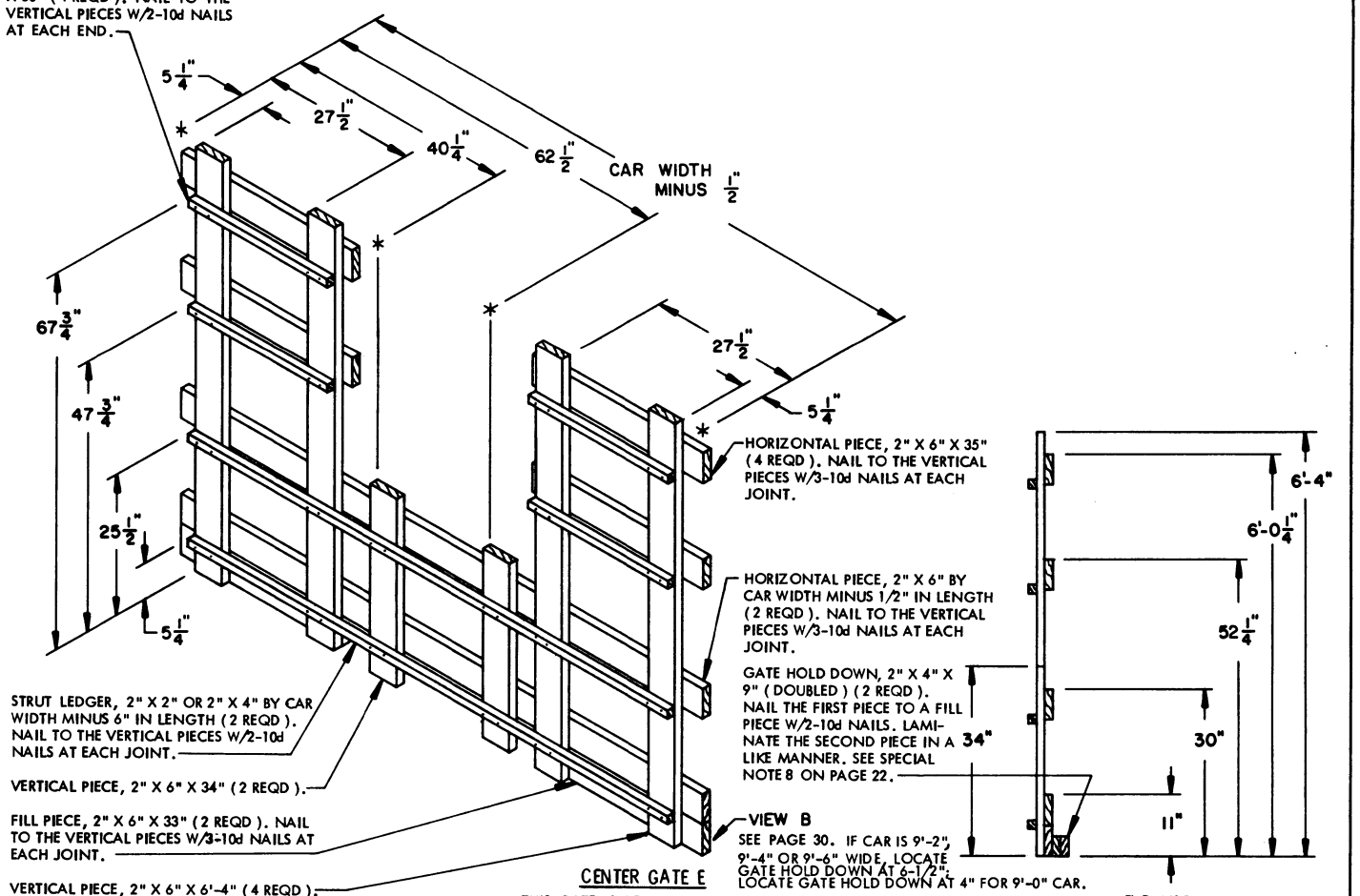
THIS ASSEMBLY IS FOR USE IN THE LOAD SHOWN ON PAGE 20 IF A 9'-2" WIDE CAR IS TO BE LOADED.



DOORWAY PROTECTION C

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

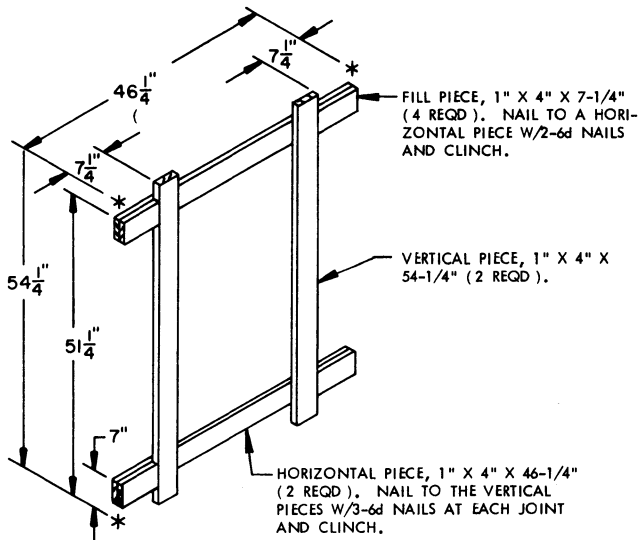
STRUT LEDGER, 2" X 2" OR 2" X 4" X 30" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.



CENTER GATE E

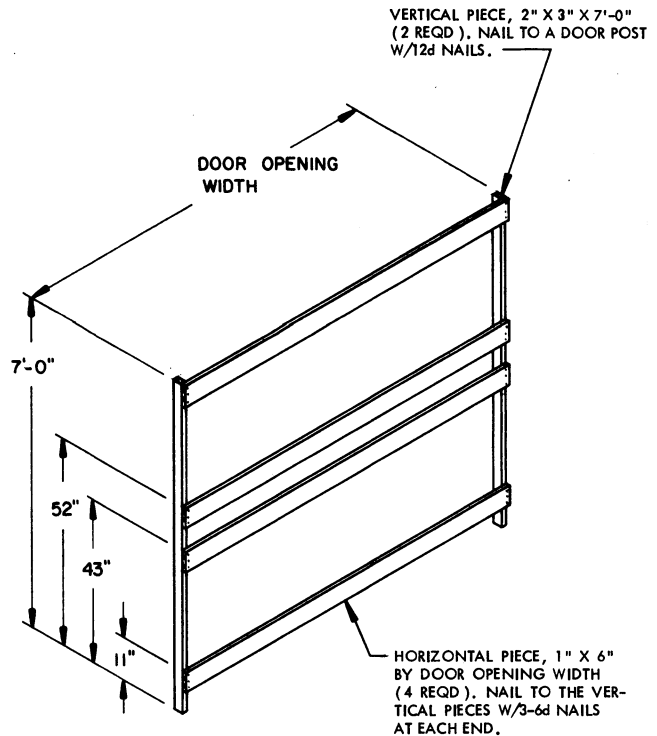
THIS GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 22. ONE RIGHT HAND AND ONE LEFT HAND GATE ARE REQUIRED. SEE SPECIAL NOTE 13 ON PAGE 23.

END VIEW



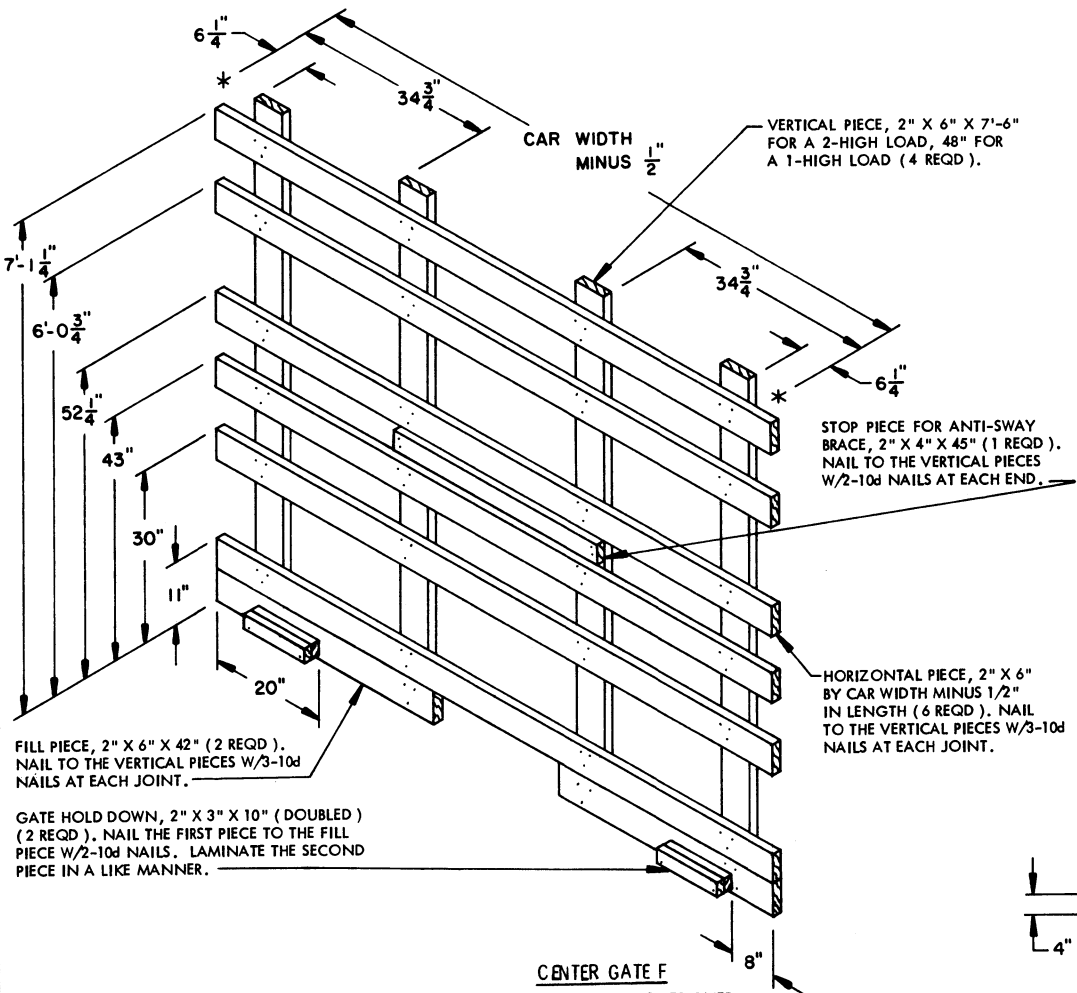
CRIB FILL H

THIS ASSEMBLY IS FOR USE IN THE LOAD ON PAGE 20 IF A 9'-2" WIDE CAR IS TO BE LOADED. CRIB FILL "H" IS NOT REQUIRED FOR A 1-HIGH LOAD; USE CRIB FILL "G" THROUGHOUT THE LENGTH OF THE LOAD.



DOORWAY PROTECTION D

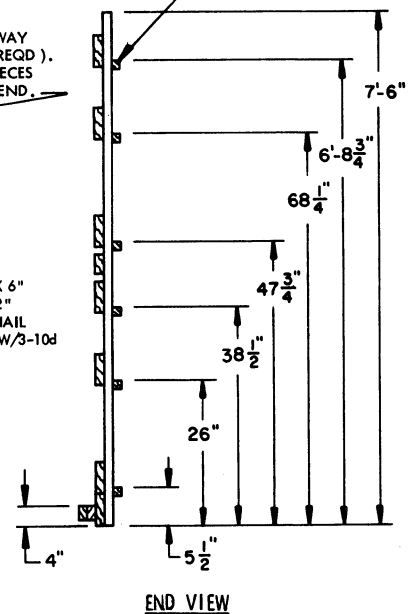
THIS ASSEMBLY IS DESIGNED FOR USE IN THE LOADS SHOWN ON PAGES 20 AND 22.



CENTER GATE F

THIS CENTER GATE IS DESIGNED FOR USE IN THE LOAD SHOWN ON PAGE 24.

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



DETAILS FOR PALLET UNIT (DECREASED HEIGHT)

BEARING PIECE, 2" X 6" X 12"
(2 REQD). NAIL TO THE
SPACER PIECE W/3-12d NAILS.

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

FABRICATE
TO FIT

STRAPPING BOARD, 2" X 6" BY
LOAD WIDTH (1 REQD). NAIL
TO THE BEARING PIECES W/2-12d
NAILS AT EACH JOINT AND TO
THE SPACER PIECE W/3-12d NAILS.

SPACER ASSEMBLY B		
LOAD PAGE	DIMENSION	
	A	B
8	33-1/2"	33-1/2"
10	46-1/4"	46-1/4"
22	33-1/2"	33-1/2"
24	46-1/4"	46-1/4"
28	46-1/4"	46-1/4"

SPACER ASSEMBLY B

THIS ASSEMBLY IS FOR USE IN THE LOADS
SHOWN ON PAGES 8, 10, 22, 24, AND
28 WHEN THE DOORWAY PROTECTION
PROCEDURES FOR PLUG DOOR CARS ARE
USED.



ONE SEAL WITH
TWO PAIR OF
NOTCHES.

STRAP JOINT A

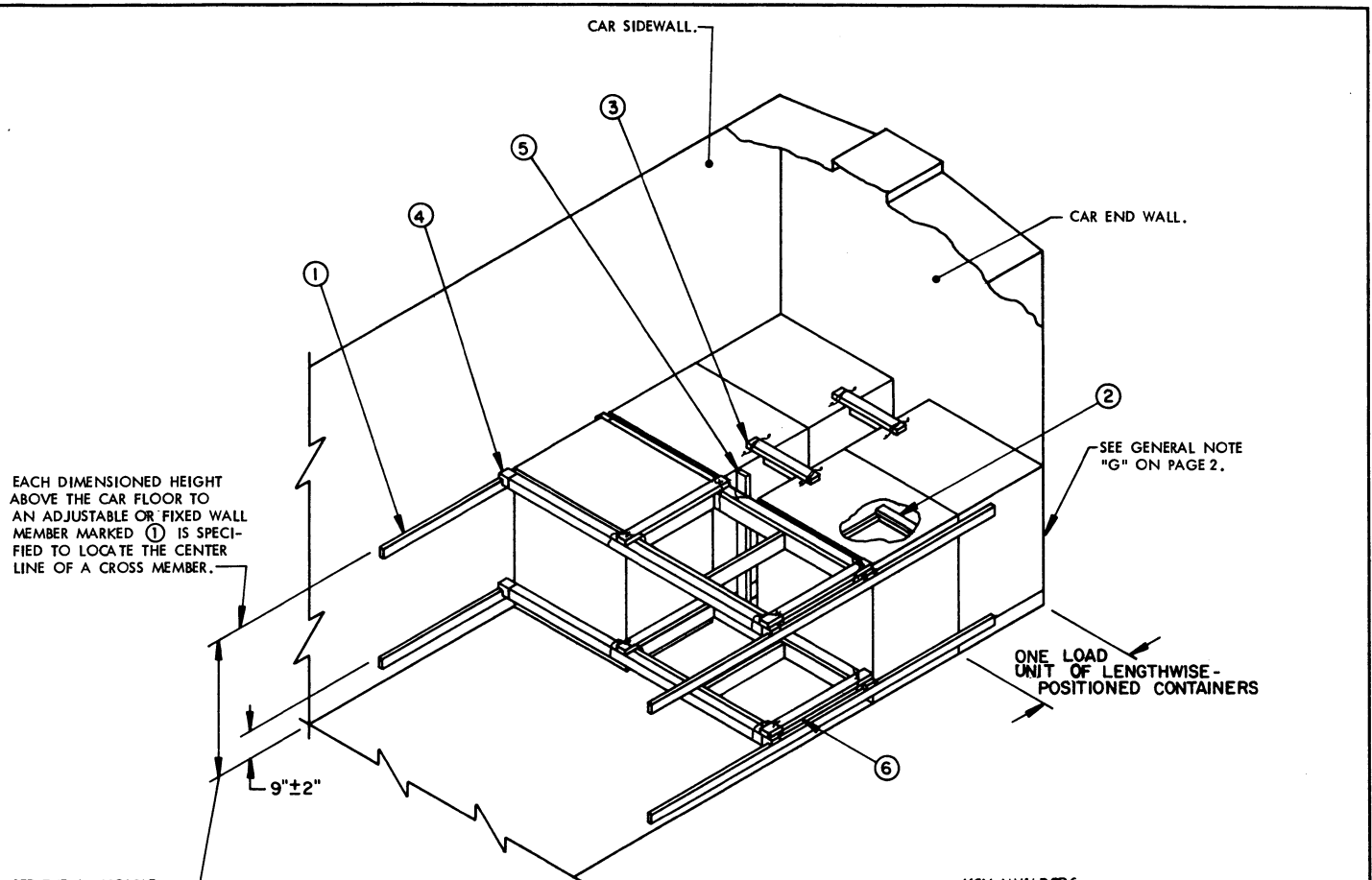
METHOD OF SECURING A
STRAP JOINT WHEN USING
A NOTCH-TYPE SEALER.



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.



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

SEE THE APPLICABLE SECTION VIEW ON PAGE 12 OR 26 TO DETERMINE HEIGHT FOR THE LOCATION OF THE UPPER WALL MEMBERS.

ISOMETRIC VIEW

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ④.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" ON PAGE 19. WIRE TIE TO PALLET UNITS AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 63.
- ④ CROSS MEMBER (4 REQD). SEE GENERAL NOTE "X" ON PAGE 3.
- ⑤ STOP PIECE, 1" X 4" X 54" FOR BASIC HEIGHT UNITS, 48" FOR DECREASED HEIGHT UNITS (1 REQD). WIRE TIE THE TOP AND BOTTOM OF THE STOP PIECE TO A CROSS MEMBER, PIECE MARKED ④, WITH NO. 14 GAGE WIRE TO PREVENT DISPLACEMENT OF THE ANTI-SWAY BRACES, PIECE MARKED ②.
- ⑥ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 35 AND SPECIAL NOTE 5 AT LEFT. WIRE TIE TO CROSS MEMBERS W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

SPECIAL NOTES:

- 1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOX CAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "D" ON PAGE 2.
- 2. THE PALLET UNIT (BASIC HEIGHT) IS SHOWN IN THE TYPICAL LCL LOAD ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT COVERED BY THIS DOCUMENT.
- 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 PIECE MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. FOUR (4) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
- 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.

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

SUPPORT PIECE, 2" X 4" X 42"
(2 REQD). NAIL TO THE LATERAL
PIECES W/1-10d NAIL AT EACH
END AND TO A LONGITUDINAL
PIECE W/6-10d NAILS.

SPACER PIECE, 2" X 6" X 32"
(1 REQD).

CUT TO SUIT

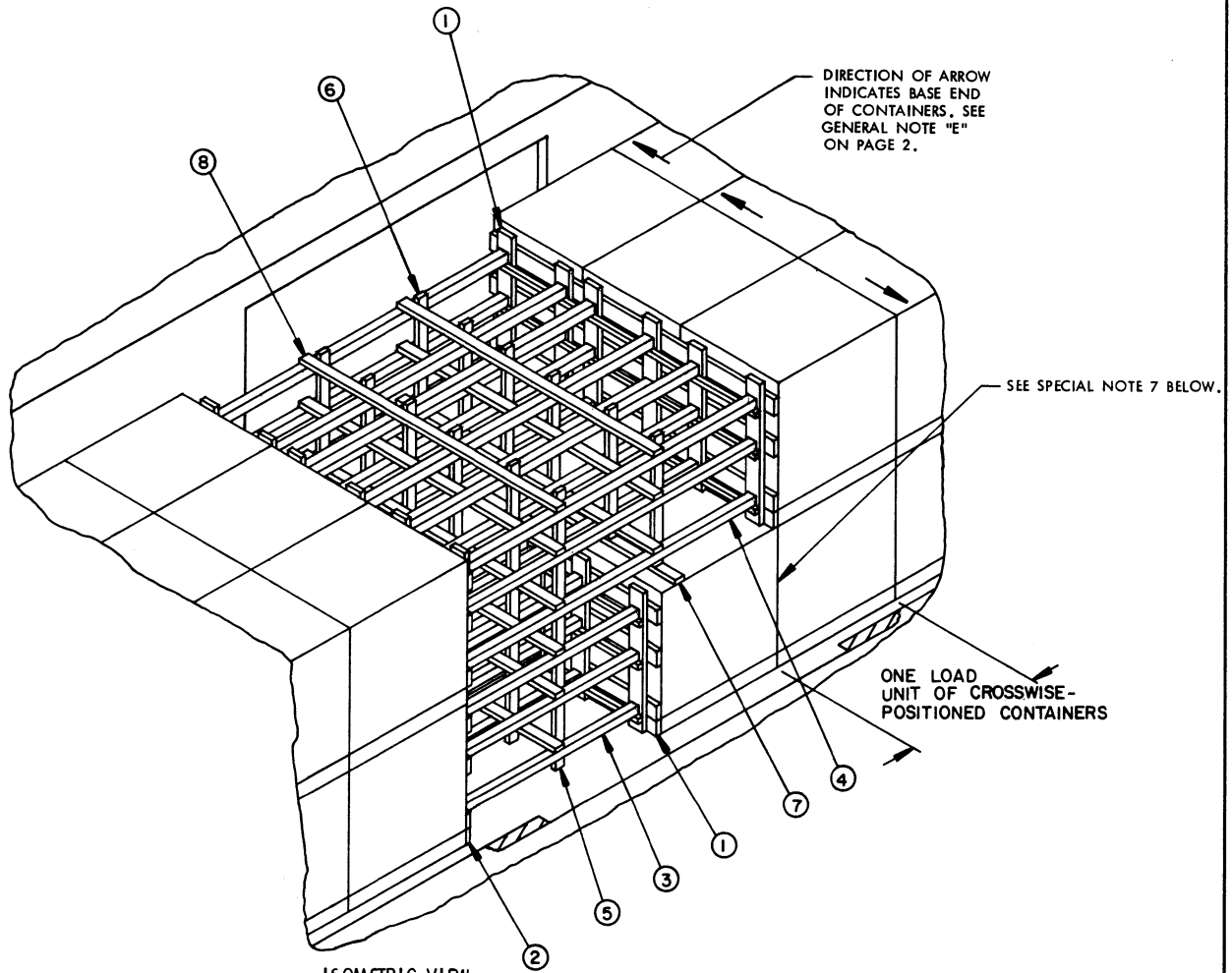
LATERAL PIECE, 2" X 6" BY A
LENGTH TO SUIT (2 REQD).
NAIL TO THE SPACER PIECE
W/3-12d NAILS.

3 1/2"

35"

LONGITUDINAL PIECE, 2" X 6" X 35"
(2 REQD), NAIL TO THE LATERAL
PIECES W/3-12d NAILS AT EACH END.

SPACER ASSEMBLY



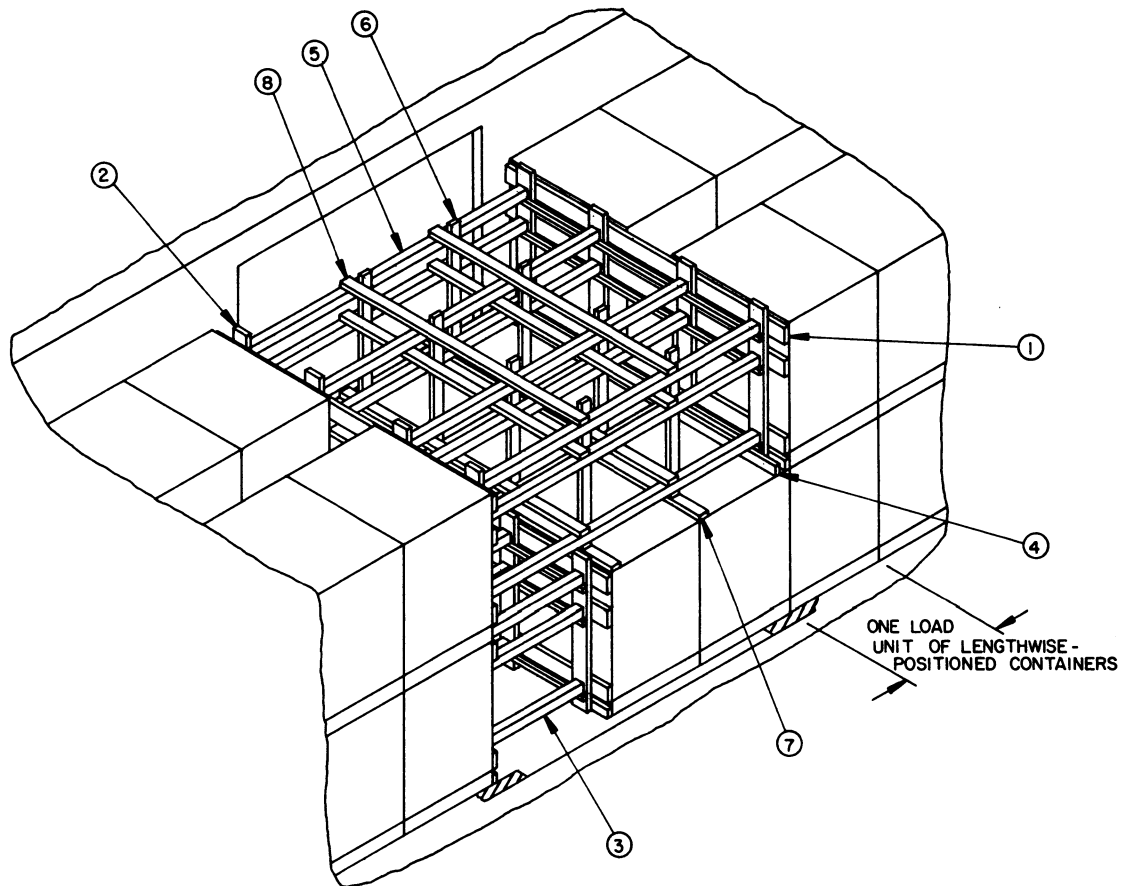
SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-6" 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 (BASIC HEIGHT) IS SHOWN IN THE VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE DECREASED HEIGHT UNIT COVERED BY THIS DOCUMENT.
3. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF THE TOP LAYER FROM A 2-HIGH LOAD ARE SHOWN AS TYPICAL.
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 "A" USED IS ONLY APPLICABLE FOR THE BASIC HEIGHT UNIT DEPICTED. THE PROPER CENTER GATE TO BE USED WILL DEPEND UPON THE UNIT BEING SHIPPED AND THE DIRECTION OF THE UNIT IN THE LOAD. 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 PIECES MARKED ⑦, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.
7. CRIB FILL STOP PIECES OF AN APPROPRIATE LENGTH, SIMILAR TO PIECES MARKED ② AND ④ ON PAGE 6, ARE REQUIRED AT THE JUNCTION OF THE 2-HIGH AND 1-HIGH PORTIONS OF THE LOAD. STOP PIECES WILL PREVENT INTERLOCKING OF THE ADJACENT CRIB FILL ASSEMBLIES.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 16. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 5 AT THE LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 16.
- ③ STRUT, 4" X 4" BY CUT TO FIT (18 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ②, IN THE FIRST LAYER AND TOENAIL W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ④ STRUT, 4" X 4" BY CUT TO FIT (18 REQD). POSITION BETWEEN THE CENTER GATES, PIECES MARKED ① AND ②, IN THE SECOND LAYER AND TOENAIL W/2-16d NAILS AT EACH END.
- ⑤ VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (6 REQD). NAIL TO THE STRUTS MARKED ③ AND ④ W/3-10d NAILS AT EACH JOINT.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (6 REQD). NAIL TO THE STRUTS MARKED ④ W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑦, W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 6 AT THE LEFT.
- ⑦ STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (1 REQD). POSITION UNDER THE VERTICAL STRUT BRACING, PIECE MARKED ⑥, AS SHOWN.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 8" (9 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

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



ISOMETRIC VIEW

SPECIAL NOTES:

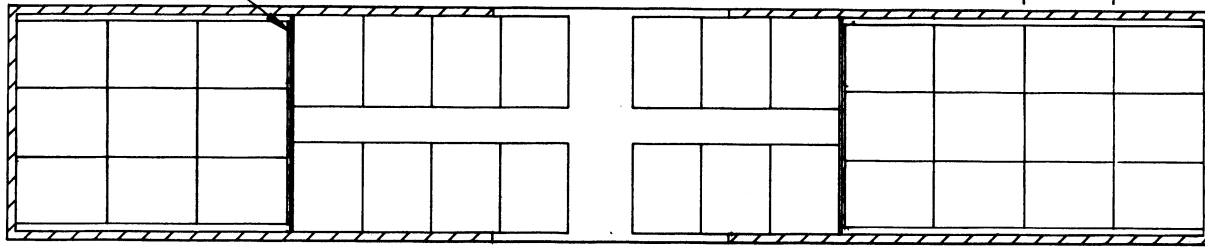
1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. THE PALLET UNIT (BASIC HEIGHT) IS SHOWN IN THE VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO ADAPTABLE FOR THE DECREASED HEIGHT UNIT 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 "C" USED IS ONLY APPLICABLE FOR THE BASIC HEIGHT 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 ⑦, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

KEY NUMBERS

- ① CENTER GATE FOR 1-HIGH (2 REQD). SEE THE CENTER GATE "C" DETAIL ON PAGE 18. SEE SPECIAL NOTE 5 AT LEFT.
- ② CENTER GATE FOR 2-HIGH (1 REQD). SEE THE CENTER GATE "C" DETAIL ON PAGE 18.
- ③ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). TOENAIL TO PIECES MARKED ① AND ② W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "L", "U", AND "V" ON PAGE 2 AND/OR 3.
- ④ SUPPORT PIECE, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE VERTICAL PIECES ON THE CENTER GATE "C", SHOWN AS PIECE MARKED ①, W/3-10d NAILS AT EACH JOINT.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). TOENAIL TO PIECES MARKED ① AND ② W/2-16d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (8 REQD). NAIL TO THE STRUTS MARKED ⑤ W/3-10d NAILS AT EACH JOINT. TOENAIL TO THE STRUT BRACING PAD, PIECE MARKED ⑦, W/1-10d NAIL AT EACH JOINT. SEE SPECIAL NOTE 6 AT LEFT.
- ⑦ STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (2 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 8" (6 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

SEPARATOR GATE (1 OR 2 REQD AS APPLICABLE). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 39. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE CROSSWISE POSITIONED CONTAINERS.

ONE LOAD UNIT OF CROSSWISE - POSITIONED CONTAINERS



TYPICAL 3-WIDE COMBINATION LOAD PATTERN PLAN VIEW

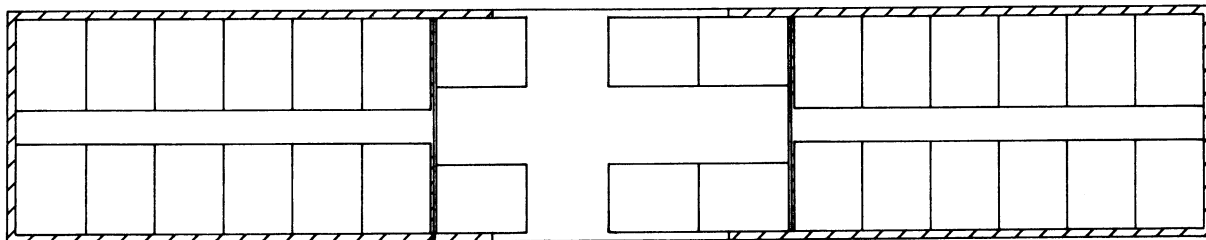
A 7-WIDE PLUS 7-LONG LOAD IS SHOWN. THIS LOAD IS IDENTIFIED AS THE CROSSWISE LOADING PATTERN.

SPECIAL NOTES:

- 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CARS ARE SHOWN IN THE VIEWS ON THIS PAGE, WIDER CARS AND CARS OF OTHER LENGTHS CAN BE USED.
- THE PROCEDURES ON THIS PAGE AND ON PAGE 39 ARE PRESENTED TO PROVIDE A METHOD OF OBTAINING A LOAD QUANTITY WHICH MAY NOT BE READILY ATTAINABLE BY ANY OF THE OTHER METHODS OF ADJUSTING A LOAD QUANTITY SPECIFIED HEREIN, INCLUDING THE DEPICTED LCL PROCEDURES.
- THE BLOCKING AND BRACING FOR THE COMBINATION LOADS OTHER THAN SEPARATOR GATE "A", HAS NOT BEEN SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR BLOCKING AND BRACING SPECIFICATIONS. A SEPARATOR GATE "A" MUST BE INSTALLED AT EVERY LOCATION WHERE THE DIRECTION OF THE UNITS CHANGES. THE GATE MUST BE POSITIONED SO THAT THE VERTICAL PIECES ARE AGAINST THE CROSSWISE UNITS IN A 3-WIDE LOAD, AND AGAINST THE LENGTHWISE UNITS IN A LENGTHWISE LOAD AS SHOWN BELOW.
- THE CHARTS FOR THE LOADS ARE SHOWN AT RIGHT. 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 CHARTS.

PALLET UNITS-BASIC HEIGHT AND DECREASED HEIGHT			
CAR LENGTH	UNITS PER LAYER	CROSSWISE LOADING PATTERN	APPROX STRUT LENGTH
40'-6" CAR	27	CROSSWISE LOAD ON PAGE 6 OR 20	61"
	28	8 WIDE AT 46-1/2" PLUS 2 LONG AT 35"	35"
	27	7 WIDE AT 46-1/2" PLUS 3 LONG AT 35"	46"
	26	6 WIDE AT 46-1/2" PLUS 4 LONG AT 35"	58"
	25	3 WIDE AT 46-1/2" PLUS 8 LONG AT 35"	57"
50'-6" CAR	36	CROSSWISE LOAD ON PAGE 6 OR 20	42"
	35	7 WIDE AT 46-1/2" PLUS 7 LONG AT 35"	26"
	34	4 WIDE AT 46-1/2" PLUS 11 LONG AT 35"	26"
	33	5 WIDE AT 46-1/2" PLUS 9 LONG AT 35"	49"
	32	4 WIDE AT 46-1/2" PLUS 10 LONG AT 35"	61"
60'-8" CAR	42	CROSSWISE LOAD ON PAGE 6 OR 20	71"
	43	13 WIDE AT 46-1/2" PLUS 2 LONG AT 35"	44"
	42	8 WIDE AT 46-1/2" PLUS 9 LONG AT 35"	32"
	41	5 WIDE AT 46-1/2" PLUS 13 LONG AT 35"	31"
	40	2 WIDE AT 46-1/2" PLUS 17 LONG AT 35"	31"
	39	3 WIDE AT 46-1/2" PLUS 15 LONG AT 35"	54"
	38	2 WIDE AT 46-1/2" PLUS 16 LONG AT 35"	66"

PALLET UNIT-BASIC HEIGHT AND DECREASED HEIGHT			
CAR LENGTH	UNITS PER LAYER	LENGTHWISE LOADING PATTERN	APPROX STRUT LENGTH
40'-6" CAR	24	LENGTHWISE LOAD ON PAGE 10 OR 24	60"
	24	10 LONG AT 35" PLUS 2 WIDE AT 46-1/2"	34"
	22	6 LONG AT 35" PLUS 5 WIDE AT 46-1/2"	34"
	20	2 LONG AT 35" PLUS 8 WIDE AT 46-1/2"	35"
50'-6" CAR	32	LENGTHWISE LOAD ON PAGE 10 OR 24	40"
	30	12 LONG AT 35" PLUS 3 WIDE AT 46-1/2"	37"
	28	8 LONG AT 35" PLUS 6 WIDE AT 46-1/2"	38"
	26	3 LONG AT 35" PLUS 10 WIDE AT 46-1/2"	27"
	24	2 LONG AT 35" PLUS 10 WIDE AT 46-1/2"	62"
60'-8" CAR	38	LENGTHWISE LOAD ON PAGE 10 OR 24	57"
	36	14 LONG AT 35" PLUS 4 WIDE AT 46-1/2"	43"
	34	10 LONG AT 35" PLUS 7 WIDE AT 46-1/2"	43"
	32	6 LONG AT 35" PLUS 10 WIDE AT 46-1/2"	44"
	30	2 LONG AT 35" PLUS 13 WIDE AT 46-1/2"	44"

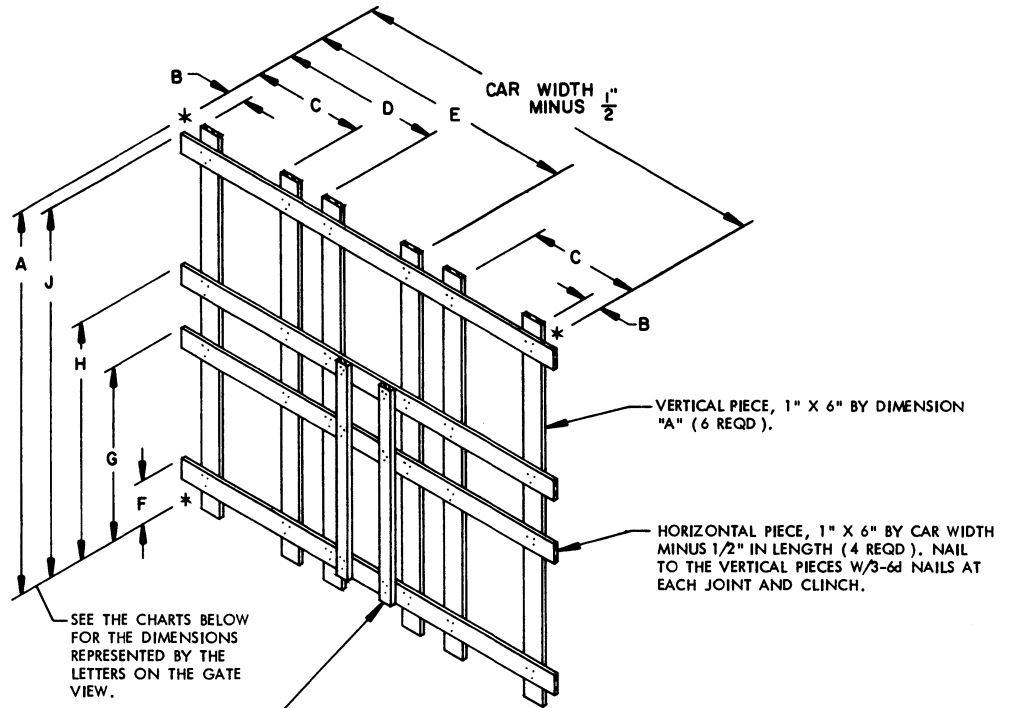


SEPARATOR GATE (1 OR 2 REQD, AS APPLICABLE). SEE THE "SEPARATOR GATE A" DETAIL ON PAGE 39. POSITION AS SHOWN WITH THE VERTICAL PIECES AGAINST THE LENGTHWISE POSITIONED CONTAINERS.

TYPICAL 2-WIDE COMBINATION LOAD PATTERN PLAN VIEW

A 12-LONG PLUS 3-WIDE LOAD IS SHOWN. THIS LOAD IS IDENTIFIED AS THE LENGTHWISE LOADING PATTERN.

ONE LOAD UNIT OF LENGTHWISE POSITIONED CONTAINERS



STOP PIECE, 2" X 4" BY A LENGTH TO SUIT (2 REQD). POSITION SO AS TO BE IN CONTACT WITH THE ADJACENT CONTAINERS AND SECURE BY NAILING THRU THE HORIZONTAL PIECES OF THE SEPARATOR GATE W/3-6d NAILS AT EACH JOINT. NOTE THAT STOP PIECES ARE ONLY REQUIRED ON SEPARATOR GATES WHICH ARE IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING.

SEPARATOR GATE A

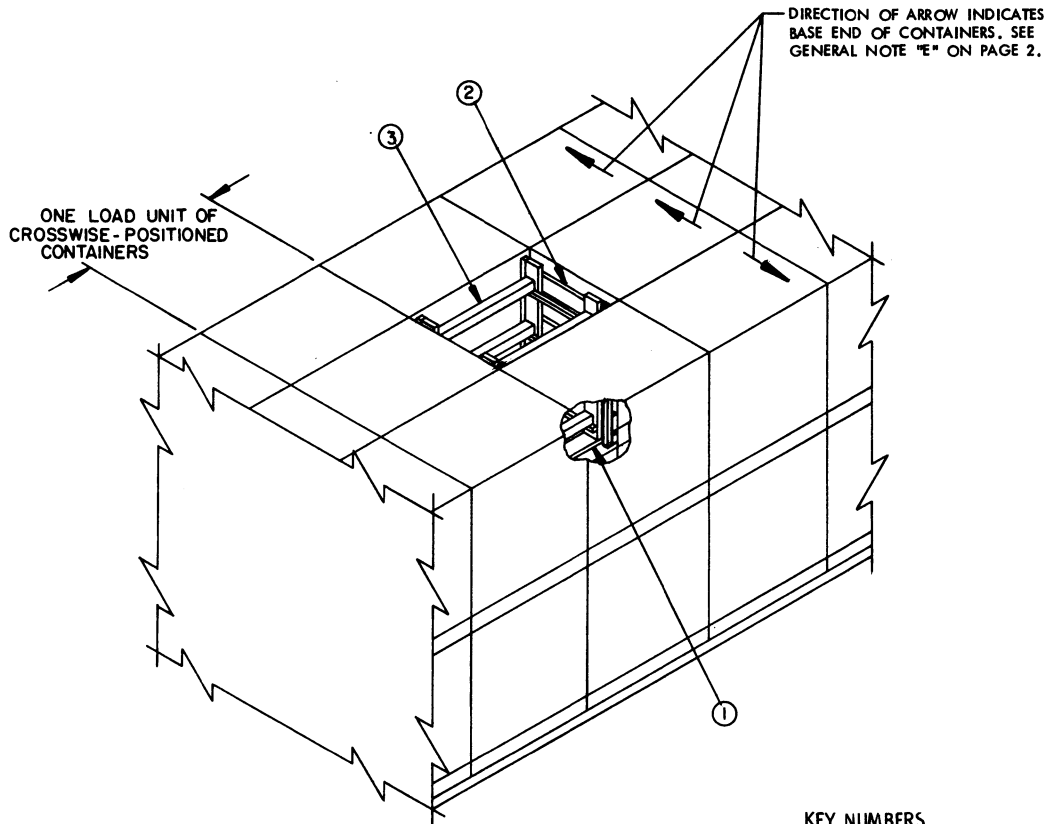
THIS VIEW DEPICTS A SEPARATOR GATE FOR USE IN THE COMBINATION LOADS SHOWN ON PAGE 38. NOTE THAT LEFT HAND AND RIGHT HAND GATES ARE REQUIRED FOR USE IN THE 3-WIDE LOAD AT THE TOP OF THE PAGE. SEE THE CHARTS BELOW FOR DIMENSIONS REPRESENTED BY THE LETTERS IN THE ABOVE VIEW.

PALLET UNIT NUMBER	DIMENSIONS FOR 3-WIDE LOAD								
	A	B *	C *	D *	E *	F	G	H	J
1	8'-0"	7-3/4"	30"	42-3/4"	65"	10"	44-1/2"	59"	7'-10"
2	6'-4"	7-3/4"	30"	42-3/4"	65"	10"	30"	52-1/4"	4'-0-1/4"

* FOR A 9'-4" WIDE CAR, DIMENSIONS "B", "C", "D", AND "E" WILL BE 8-3/4", 31", 43-3/4" AND 66". FOR A 9'-6" WIDE CAR, THESE DIMENSIONS WILL BE 9-3/4", 32", 44-3/4", AND 67".

PALLET UNIT NUMBER	DIMENSIONS FOR 2-WIDE LOAD								
	A	B	C	D	E	F	G	H	J
1	8'-6"	6-1/4"	20-1/2"	34-3/4"	---	10"	50"	59-1/2"	8'-3-1/2"
2	7'-4"	6-1/4"	20-1/2"	34-3/4"	---	10"	43"	52-1/4"	7'-1-1/4"

PALLET UNIT IDENTIFICATION	SHOWN AS UNIT NUMBER
PALLET UNIT (BASIC HEIGHT)	1
PALLET UNIT (DECREASED HEIGHT)	2



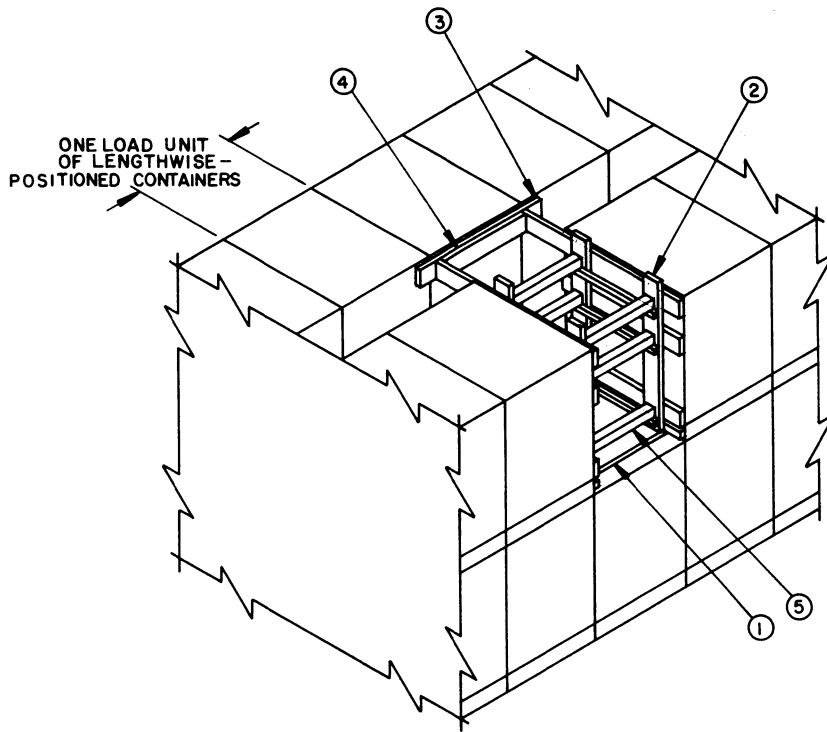
SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE PARTIAL VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
3. A UNIT OMITTED FROM THE TOP LAYER OF A 2-LAYER OF A 3-WIDE LOAD IS SHOWN AS TYPICAL. THE PROCEDURES MAY BE APPLIED FOR A 1-LAYER LOAD AND/OR FOR A 2-WIDE 1-LAYER OR 2-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.
6. IF THE PALLET UNIT OMITTED PROCEDURES ARE TO BE USED IN THE 5-PALLET LOAD UNIT PROCEDURES (REF: PAGE 8), OR IN A 4-PALLET LOAD UNIT PROCEDURE (REF: SPECIAL NOTE 10 ON PAGE 9), THE LOAD BEARING GATES MUST BE MODIFIED. OMIT THE 2" X 2" PIECE FROM THE SIDE OF THE GATE WHICH WILL BE ADJACENT TO THE VOID AREA. EXTEND THE 2" X 6" HORIZONTAL PIECES SO AS TO CONTACT THE PALLET UNITS ON THE OPPOSITE SIDE OF THE CAR. APPLY A VERTICAL 2" X 4" PIECE AT THE ENDS OF THESE HORIZONTAL PIECES TO BEAR AGAINST THE PALLET UNIT.

ISOMETRIC VIEW

KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 46-1/2" (2 REQD). POSITION SO AS TO BE BENEATH THE 2" X 6" VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE DETAIL ON PAGE 42. 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: 40-1/2") (AS REQD). TOENAIL TO PIECES MARKED ② W/2-16d NAILS AT EACH END.



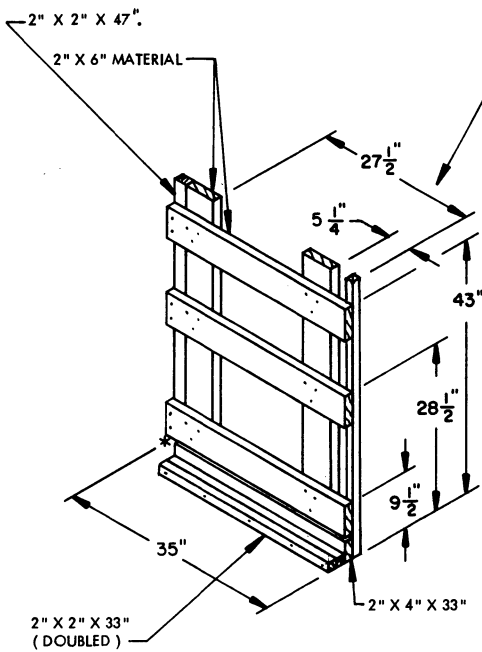
ISOMETRIC VIEW

SPECIAL NOTES:

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

KEY NUMBERS

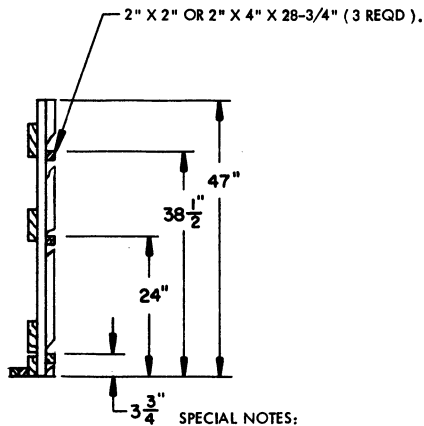
- ① SUPPORT PIECE, 2" X 6" X 35" (2 REQD). POSITION SO AS TO BE UNDER THE VERTICAL PIECES OF THE LOAD BEARING GATE, PIECE MARKED ②.
- ② LOAD BEARING GATE (2 REQD, 1 RIGHT HAND AND 1 LEFT HAND). SEE THE APPLICABLE DETAIL ON PAGE 43. NAIL TO THE FILLER PIECE, PIECE MARKED ④ W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ①, W/2-10d AT EACH JOINT. **CAUTION:** USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 48" (1 REQD).
- ④ FILLER PIECE, 2" X 6" X 32" (1 REQD). NAIL TO THE ANTI-SWAY BEARING PIECE, PIECE MARKED ③, W/5-10d NAILS.
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (REF: 29") (6 REQD). 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 (BASIC HEIGHT) 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.

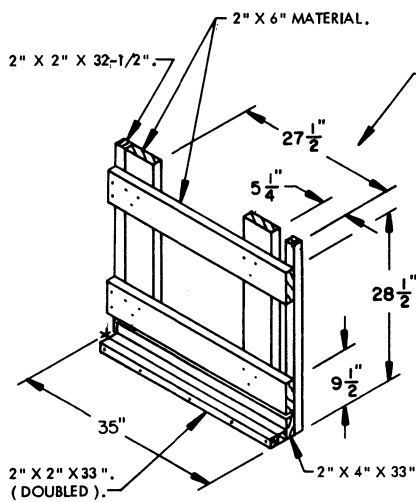
THIS END OF GATE IS TO BE ALIGNED WITH THE BASE ENDS OF THE CONTAINERS.



END VIEW

SPECIAL NOTES:

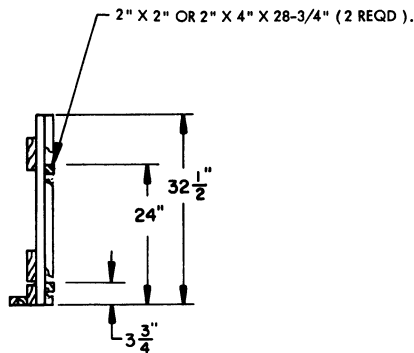
1. THE GATES SHOWN ON THIS PAGE ARE FOR USE WITH THE INDICATED PALLET UNITS IN THIS DOCUMENT. THEY ARE ONLY USED FOR THE LCL PROCEDURES SHOWN ON PAGE 40. THESE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF CROSSWISE POSITIONED CONTAINERS.
2. THE REFERENCE DIMENSIONS GIVEN FOR THE CUT-TO-FIT 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 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 AS APPLICABLE, W/4-10d NAILS IN EACH LAYER. NAIL THE 2" X 2" OR 2" X 4" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.



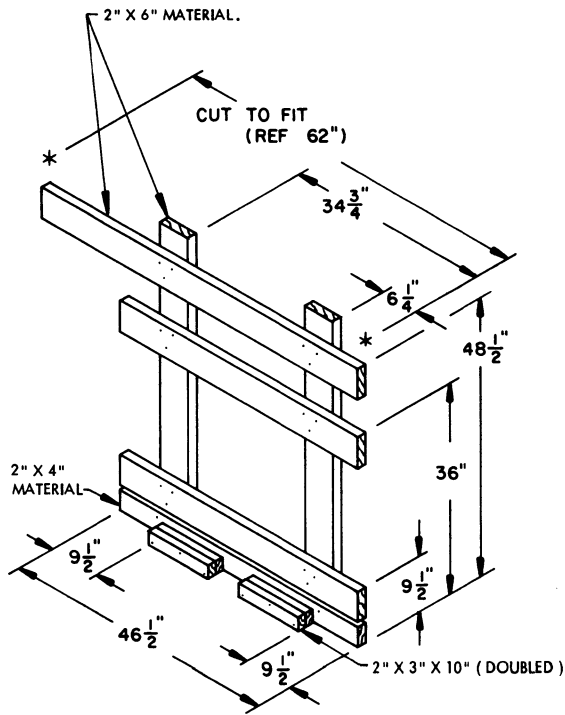
LOAD BEARING GATE B

THIS GATE IS FOR USE IN A LOAD OF (DECREASED HEIGHT) 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.

THIS END OF GATE IS TO BE ALIGNED WITH THE BASE ENDS OF THE CONTAINERS.

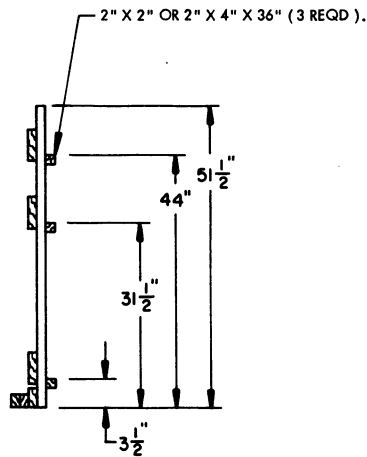


END VIEW



LOAD BEARING GATE C

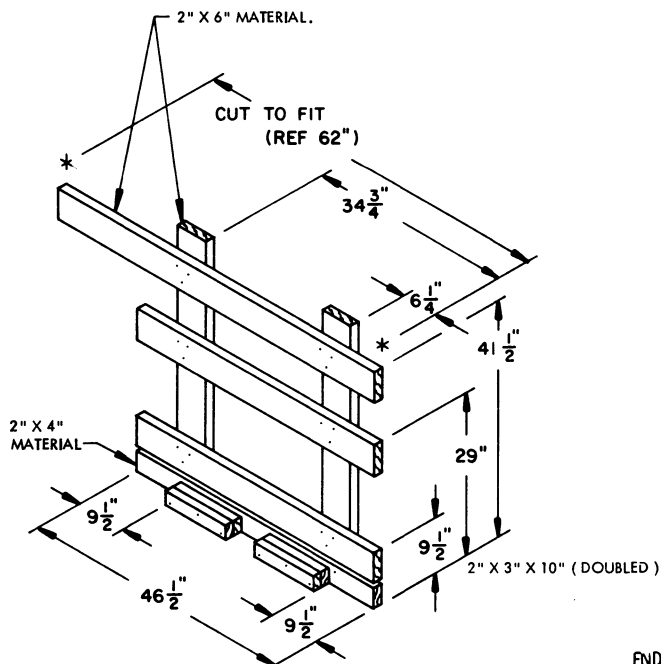
THIS GATE IS FOR USE IN A LOAD OF (BASIC HEIGHT) PALLET UNITS. SEE SPECIAL NOTE 3 AT RIGHT FOR NAILING GUIDANCE. ONE RIGHT HAND AND ONE LEFT HAND GATE REQUIRED. A LEFT HAND GATE IS SHOWN.



END VIEW

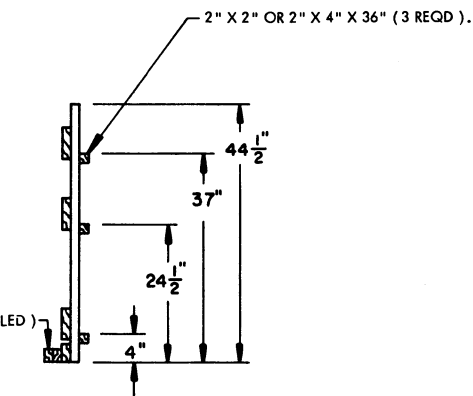
SPECIAL NOTES:

1. THE GATES SHOWN ON THIS PAGE ARE FOR USE WITH THE INDICATED PALLET UNITS USED IN THIS DOCUMENT. THEY ARE ONLY USED FOR THE LCL PROCEDURES SHOWN ON PAGE 41. THESE PROCEDURES DEPICT THE OMISSION OF A PALLET UNIT FROM A LOAD OF LENGTHWISE-POSITIONED CONTAINERS.
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 VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. NAIL THE DOUBLED 2" X 3" GATE HOLD DOWN PIECES TO A 2" X 4" PIECE W/2-10d NAILS IN EACH LAYER. NAIL THE 2" X 2" STRUT LEDGERS TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

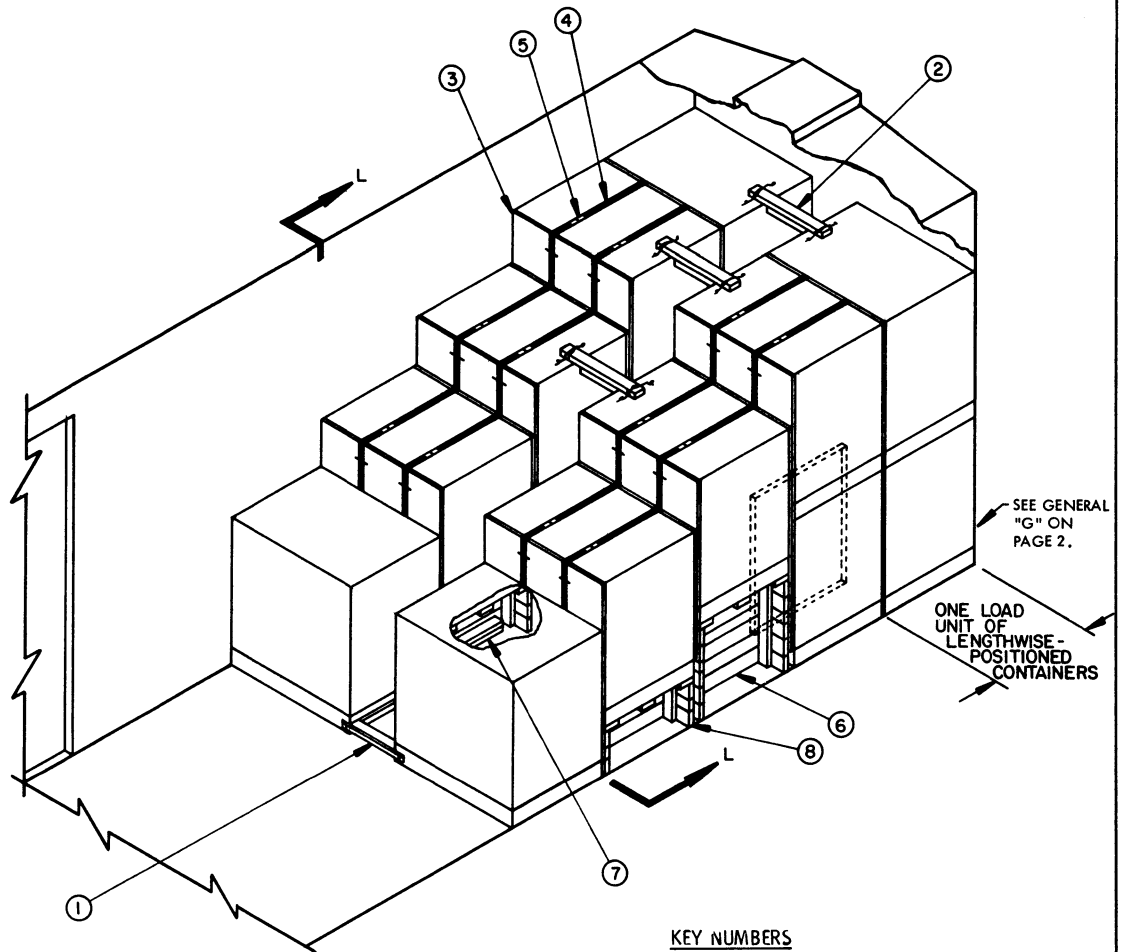


LOAD BEARING GATE D

THIS GATE IS FOR USE IN A LOAD OF (DECREASED HEIGHT) 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.



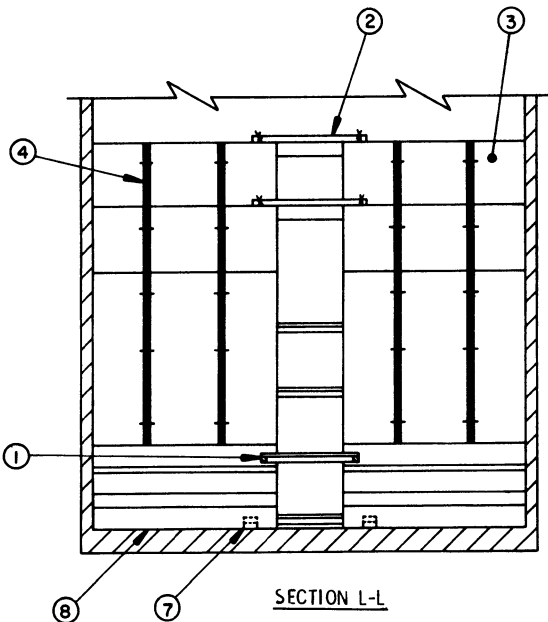
END VIEW



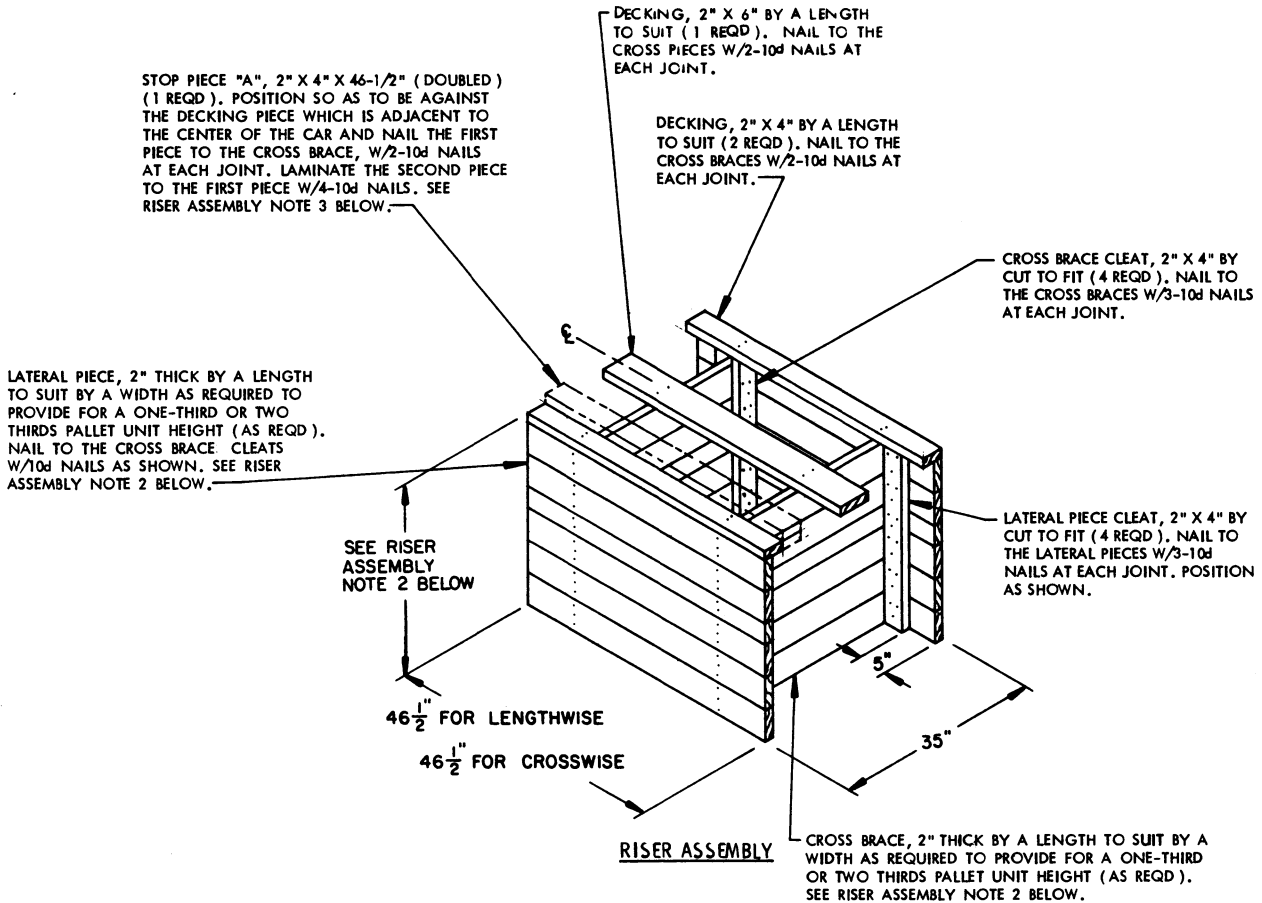
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 45.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECE (5) OF THE TOP DUNNAGE ASSEMBLY OF UNIT AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 63. SEE SPECIAL NOTE 6 ON PAGE 45.
- ③ SIDE FILL ASSEMBLY, (16 REQD/2 PER PALLET UNIT). SEE THE "SIDE FILL ASSEMBLY A" DETAIL ON PAGE 46. POSITION AS SHOWN IN THE "METHOD A" DETAIL ON PAGE 46.
- ④ REINFORCING STRAP, 1-1/4" X .035" OR .031" X 15'-0" LONG (REF) STEEL STRAPPING (16 REQD). INSTALL TO ENIRCLE THE PALLET UNIT AND THE SIDE FILL ASSEMBLIES. SECURE TO EACH SIDE FILL ASSEMBLY W/3 STAPLES. SEE THE "METHOD A" DETAIL ON PAGE 46.
- ⑤ SEAL FOR 1-1/4" STRAPPING (32 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "O" ON PAGE 2.
- ⑥ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE TWO-THIRDS OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 45.
- ⑦ STOP PIECE SIDE BLOCKING, 2" X 4" X 24" (DOUBLED) (4 REQD/1 PER RISER ASSEMBLY). POSITION AGAINST THE CROSS BRACES OF THE RISER ASSEMBLY AS SHOWN. NAIL THE FIRST PIECE TO THE CAR FLOOR W/3-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑧ 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 45.



SECTION L-L



SPECIAL NOTES:

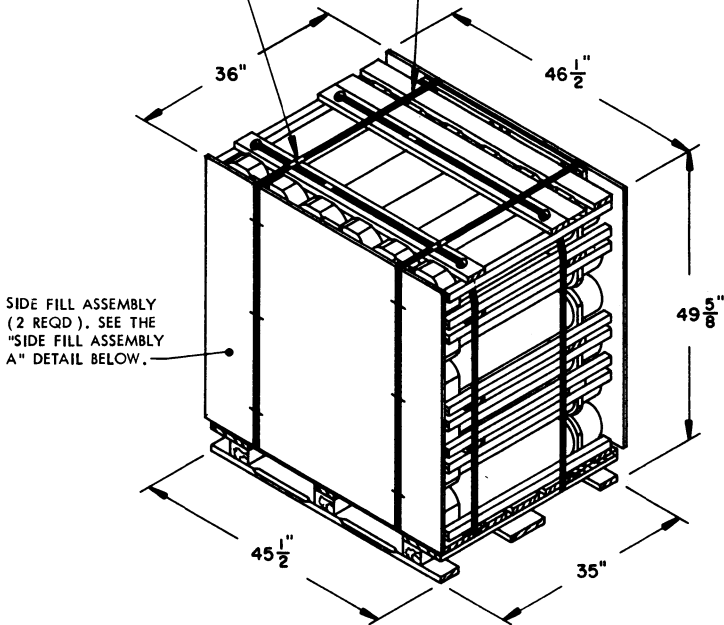
1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOX CAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE VIEW ON PAGE 44. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT PALLET UNIT.
3. THE RISER METHOD OF PARTIAL LAYER BRACING IS TYPICALLY SHOWN WITH THE PALLET UNITS POSITIONED SO THE CONTAINERS ARE LENGTHWISE IN THE CAR. WITH MODIFICATIONS THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE POSITIONED CONTAINERS. SEE SPECIAL NOTES 5, 6, AND 8.
4. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGES FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
5. ANTI-SWAY BRACE "B" IS APPLICABLE FOR THE LENGTHWISE POSITIONED CONTAINERS. ANTI-SWAY BRACE "A", AS DETAILED ON PAGE 19, WILL BE USED FOR CROSSWISE POSITIONED CONTAINERS. NOTE THAT IF A 9'-1" CAR OR WIDER IS USED AND THE UNITS ARE POSITIONED WITH THE CONTAINERS CROSSWISE AND 3-WIDE, ANTI-SWAY BRACING WILL BE OMITTED AND CRIB FILL MUST BE USED.
6. TOP-OF-LOAD ANTI-SWAY BRACE "B" IS APPLICABLE FOR THE LENGTHWISE POSITIONED CONTAINERS. TOP-OF-LOAD ANTI-SWAY BRACE "A", AS DETAILED ON PAGE 19, WILL BE USED FOR CROSSWISE POSITIONED CONTAINERS. NOTE THAT IF A 9'-3" OR NARROWER CAR IS USED AND THE CONTAINERS ARE POSITIONED CROSSWISE AND 3-WIDE, TOP-OF-LOAD ANTI-SWAY BRACING WILL NOT BE REQUIRED.
7. FOR CROSSWISE POSITIONED CONTAINERS, THE METHOD "B" DETAILS FOR SIDE FILL ASSEMBLIES, SHOWN ON PAGE 47, WILL BE USED IN LIEU OF THE METHOD "A" SIDE FILL ASSEMBLIES. FOR LOADS OF CROSSWISE POSITIONED CONTAINERS, STOP PIECE "A", AS SHOWN ON THE RISER DETAIL ABOVE, WILL BE USED IN LIEU OF THE SIDE BLOCKING STOP PIECES, PIECE MARKED ⑦, IN THE LCL LOAD ON PAGE 44.
8. IF THE RISER METHOD PROCEDURE IS USED IN A 3-WIDE LOAD OF CONTAINERS CROSSWISE UNITS, THE CRIB FILL ASSEMBLIES MUST BE MODIFIED. THE HEIGHT OF THE HORIZONTAL PIECES MUST BE ADJUSTED FOR THOSE UNITS ON RISERS SO AS TO BEAR AGAINST THE UNITS AT THE SAME LOCATION AS THE HIGH CRIB FILL FOR THE UNIT BEING LOADED. NOTE THAT STOP PIECES ARE REQUIRED ON EACH END OF EACH MODIFIED CRIB FILL AS WELL AS ON THE ADJACENT END OF EACH REGULAR HEIGHT CRIB FILL TO PREVENT INTERLOCKING OF THE ASSEMBLIES.

SPECIAL NOTES FOR RISER ASSEMBLY:

1. THE TYPICAL RISER ASSEMBLY SHOWN ABOVE IS FOR THE (BASIC HEIGHT) PALLET UNIT. THE HEIGHT OF THIS UNIT IS 49-5/8". A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER ⑥ IN THE LOAD ON PAGE 44. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM FIVE (5) PIECES OF 2" X 6" MATERIAL AND ONE (1) PIECE OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 32-1/2" AFTER THE DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER, SHOWN AS KEY NUMBER ⑦ IN THE LOAD ON PAGE 44, WILL BE FABRICATED FROM TWO (2) PIECES OF 2" X 6" MATERIAL AND ONE (1) 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 16" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL/CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE PALLET UNIT BEING LOADED AND THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. **NOTE:** A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT.
3. THE STOP PIECE "A" SHOWN ON THE RISER ASSEMBLY ABOVE IS ONLY FOR USE WHEN THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS CROSSWISE IN THE CAR. IF THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS LENGTHWISE, AS IN THE LCL LOAD ON PAGE 44, SIDE BLOCKING IS USED AS A STOP PIECE FOR THE RISER.

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

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

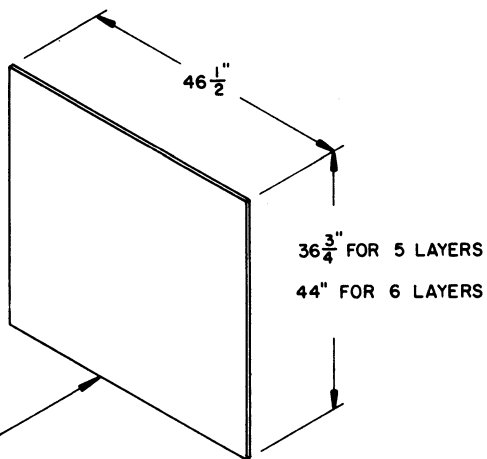


METHOD A

FOR USE WITH THE BASIC HEIGHT AND THE DECREASED HEIGHT UNITS. THE BASIC HEIGHT UNIT IS SHOWN.

NOTE:

THE "METHOD A" DETAIL AT LEFT SHOWS THE MODIFICATION REQUIRED FOR A PALLET UNIT WHICH IS TO BE POSITIONED WITH THE CONTAINERS LENGTHWISE IN A CAR WHEN USING THE RISER METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 44. THE BASIC HEIGHT PALLET UNIT IS SHOWN, HOWEVER, THE PROCEDURE IS ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT. FOR MODIFICATION OF PALLET UNITS TO BE POSITIONED WITH THE CONTAINERS CROSSWISE IN A CAR, REFER TO THE "METHOD B" DETAIL ON PAGE 47.



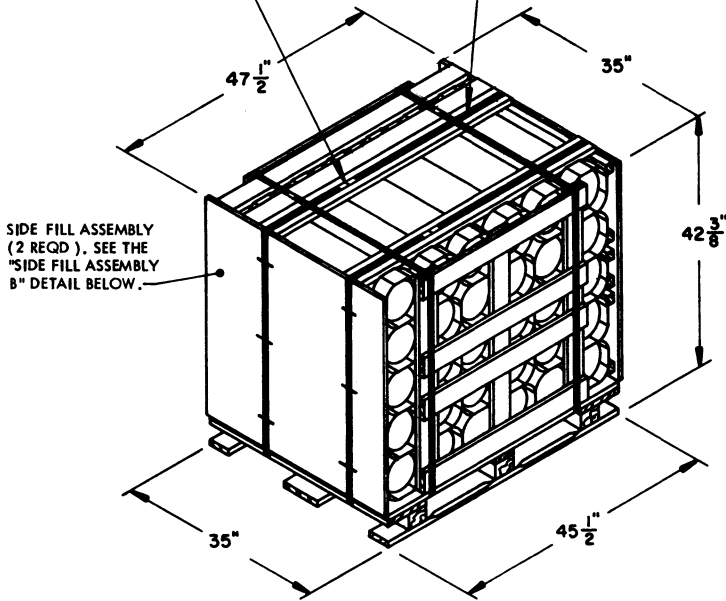
PLYWOOD, 1/2" BY A WIDTH TO SUIT X 46-1/2" (1 REQD).

SIDE FILL ASSEMBLY A

FOR METHOD "A" ABOVE.

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

REINFORCING STRAP, 1-1/4" X .035" X 15'-0"
LONG STEEL STRAPPING FOR 5-LAYER UNITS
AND 16'-0" FOR 6-LAYER UNITS. POSITION
AS SHOWN TO ENCIRCLE THE PALLET UNIT
AND THE SIDE FILL ASSEMBLIES, SECURE TO
EACH SIDE FILL ASSEMBLY W/3 STAPLES.



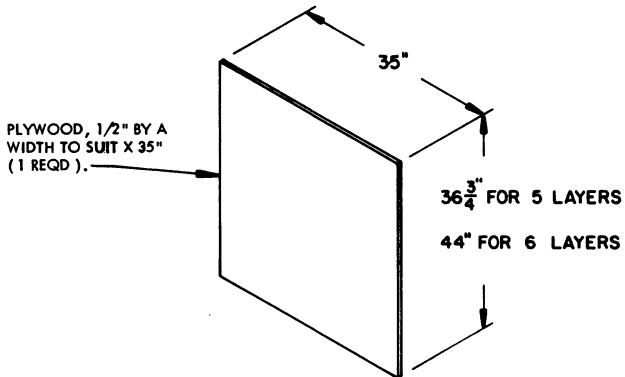
SIDE FILL ASSEMBLY
(2 REQD), SEE THE
"SIDE FILL ASSEMBLY
B" DETAIL BELOW.

METHOD B

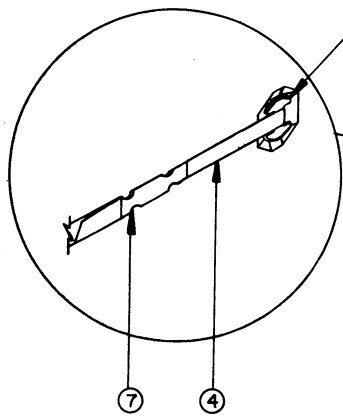
FOR USE WITH THE BASIC HEIGHT
AND THE DECREASED HEIGHT UNITS.
THE BASIC HEIGHT UNIT IS SHOWN.

NOTE:

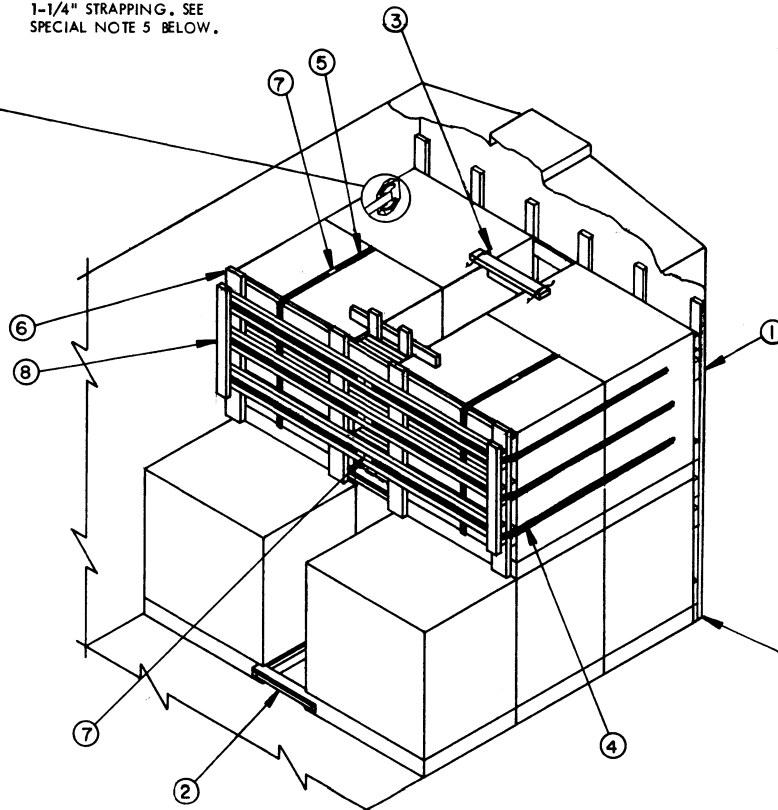
THE "METHOD 3" DETAIL AT LEFT SHOWS THE MODIFICATION
REQUIRED FOR A PALLET UNIT WHICH IS TO BE POSITIONED WITH
THE CONTAINERS CROSSWISE IN A CAR WHEN USING THE RISER
METHOD OF PARTIAL-LAYER BRACING SHOWN ON PAGE 44. THE
DECREASED HEIGHT UNIT IS SHOWN, HOWEVER, THE PROCEDURE
IS ALSO APPLICABLE FOR THE BASIC HEIGHT PALLET UNIT. FOR
MODIFICATION OF PALLET UNITS TO BE POSITIONED WITH
THE CONTAINERS LENGTHWISE IN A CAR, REFER TO THE "METHOD
A" DETAIL ON PAGE 46.



SIDE FILL ASSEMBLY B
FOR METHOD "B" ABOVE.



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



SEE GENERAL NOTE "G" ON PAGE 2.

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 BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LCL LOAD ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT COVERED BY THIS DOCUMENT.
3. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED CONTAINERS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED CONTAINERS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.
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. A BULKHEAD GATE WITH 2 STRAPS WILL RETAIN 3 BASIC HEIGHT OR DECREASED HEIGHT PALLET UNITS; A BULKHEAD GATE WITH 3 STRAPS WILL RETAIN 4 BASIC HEIGHT PALLET UNITS OR 5 DECREASED HEIGHT UNITS.
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 37 FOR AN EVEN QUANTITY OF UNITS, OR THE PALLET UNIT OMITTED PROCEDURES ON PAGE 41 FOR A SINGLE UNIT.

(CONTINUED ON PAGE 49)

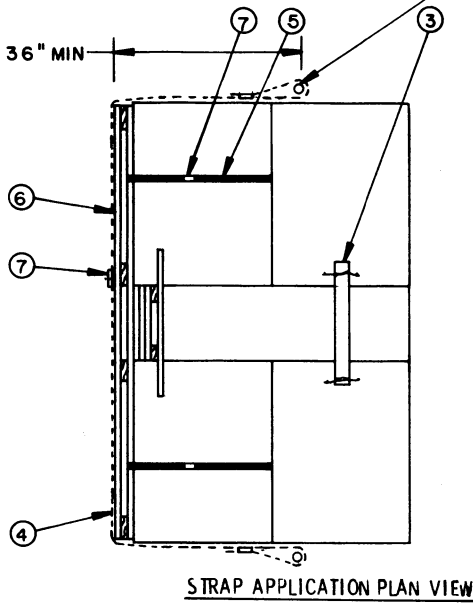
KEY NUMBERS

- ① END-WALL LINING (1 REQD.). SEE THE DETAIL AND SPECIAL NOTE 1 ON PAGE 65. SEE GENERAL NOTE "D" ON PAGE 2. NOTE THAT IF AN END-OF-CAR BULKHEAD AS DETAILED ON PAGE 65 IS USED, THE END-WALL LINING IS NOT REQUIRED.
- ② ANTI-SWAY BRACE (5 REQD.). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD.). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 64.
- ④ BULKHEAD STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (3 REQD.). INSTALL FROM TWO EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 49 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 4 AND 5 AT LEFT.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" X 15'-0" LONG (REF) STEEL STRAPPING (2 REQD.). ENCIRCLE THE PALLET UNIT AND THE HORIZONTAL PIECES OF THE BULKHEAD GATE. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECE MARKED ④.
- ⑥ BULKHEAD GATE (1 REQD.). SEE THE DETAIL ON PAGE 49. SEE SPECIAL NOTE 3 AT LEFT.
- ⑦ SEAL FOR 1-1/4" STEEL STRAPPING (14 REQD., 4 PER BULKHEAD STRAP, PIECE MARKED ④), AND 1 PER BUNDLING STRAP, PIECE MARKED ⑤).
- ⑧ STRAP RETAINER, 2" X 4" BY A LENGTH TO SUIT (2 REQD.). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.

INDICATES STRAP ANCHOR DEVICE.

(SPECIAL NOTES CONTINUED)

- THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED 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 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.

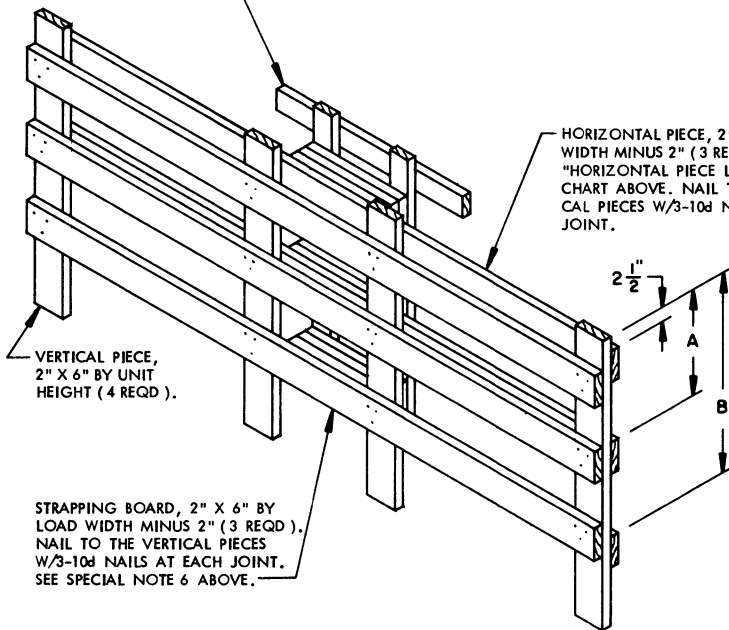


HORIZONTAL PIECE LOCATION				
PALLET UNITS	5-HIGH		6-HIGH	
	DIM A	DIM B	DIM A	DIM B
	141/2" ±1"	35" ±1"	141/2" ±1"	42" ±1"

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

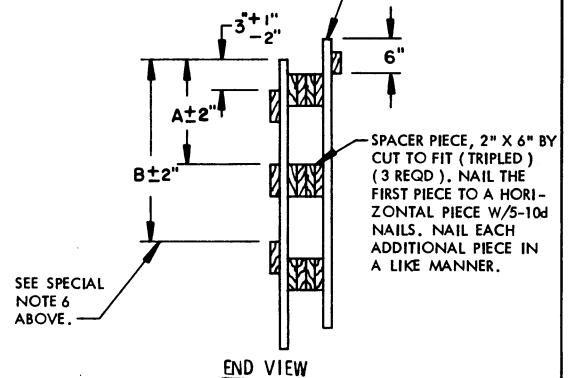
HORIZONTAL PIECE, 2" X 6" BY LOAD WIDTH MINUS 2" (3 REQD). SEE THE "HORIZONTAL PIECE LOCATION" CHART ABOVE. NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

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



VERTICAL PIECE, 2" X 6" BY UNIT HEIGHT (4 REQD).

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



SEE SPECIAL NOTE 6 ABOVE.

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

BULKHEAD GATE

END VIEW

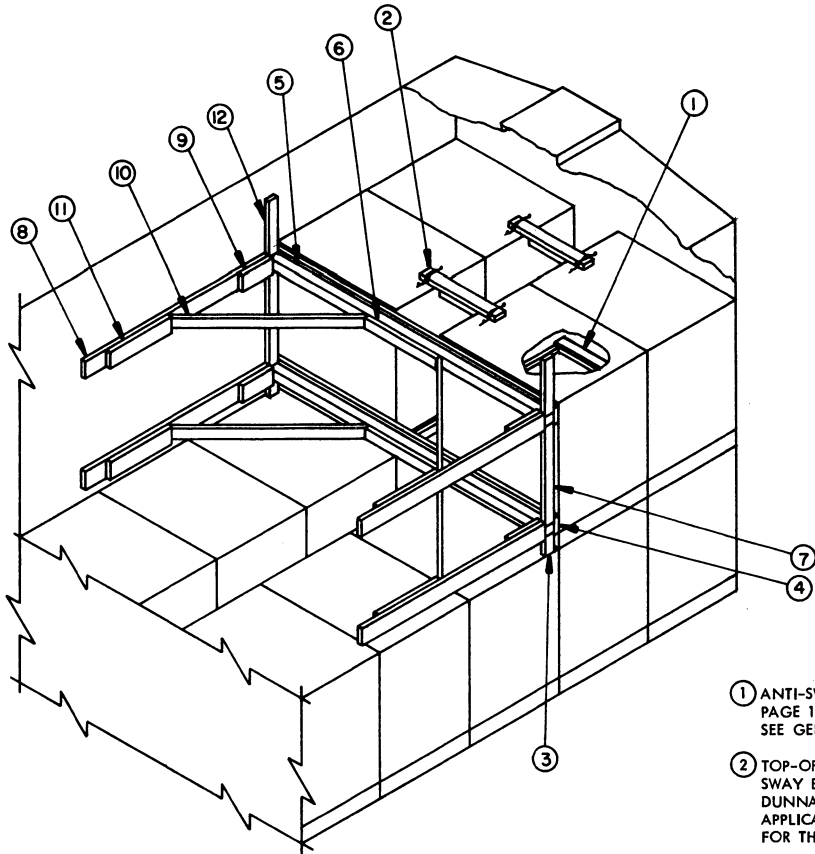
TYPICAL LCL LOAD USING BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING

(SPECIAL NOTES CONTINUED)

5. CAUTION: SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ③, ④, ⑤, ⑦, ⑨, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE END OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL. CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LCL OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.
6. THE CENTER CLEAT, SHOWN AS PIECE MARKED ⑥, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.

KEY NUMBERS

- ① ANTI-SWAY BRACE (6 REQD). SEE THE "ANTI-SWAY BRACE B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY OF UNIT AS SHOWN BY THE APPLICABLE TIE WIRE APPLICATION DETAIL ON PAGE 63. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL TIER UNITS.
- ③ SUPPORT CLEAT, 2" X 4" X 5" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES ④ AND ⑤ ON THE BOTTOM HORIZONTAL PIECES OF THE END DUNNAGE ASSEMBLY ON THE UNIT. SEE SPECIAL NOTE 5 ABOVE.
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/1-12d NAIL EVERY 6".
- ⑤ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH IN LENGTH (CUT TO FIT) (2 REQD).
- ⑥ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, W/7-16d NAILS. SEE SPECIAL NOTE 6 ABOVE.
- ⑦ SPACER CLEAT, 2" X 4" X 36-1/2" FOR 6-LAYER UNITS, 29-1/2" FOR 5-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑧ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑨ POCKET CLEAT, 2" X 6" X 12" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/4-16d NAILS.
- ⑩ DIAGONAL BRACE, 2" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ⑤, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/2-16d NAILS AT EACH END.
- ⑪ BACK UP CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑧, W/8-16d NAILS.
- ⑫ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

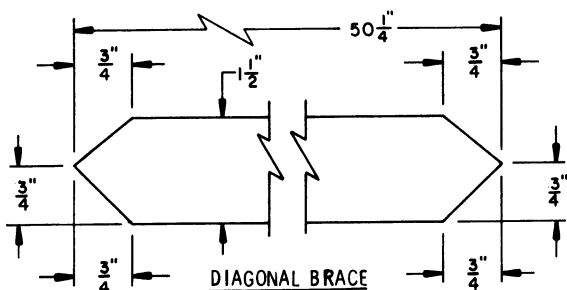


SPECIAL NOTES:

ISOMETRIC VIEW

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOX CAR IS SHOWN. WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL LCL LOAD ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
3. PARTIAL LAYER BRACING MAY BE APPLIED FOR ANY OF THE CONVENTIONAL CAR LOADS DEPICTED HEREIN. A CONTAINERS LENGTH-WISE LOAD IS SHOWN AS TYPICAL. THE BLOCKING AND BRACING WILL VARY FOR CONTAINERS CROSSWISE LOADS.
4. THE K-BRACE METHOD OF PARTIAL LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A OF A PARTIAL TOP TIER, BE IT A SECOND TIER, OR A 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 51, 52, 53 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.

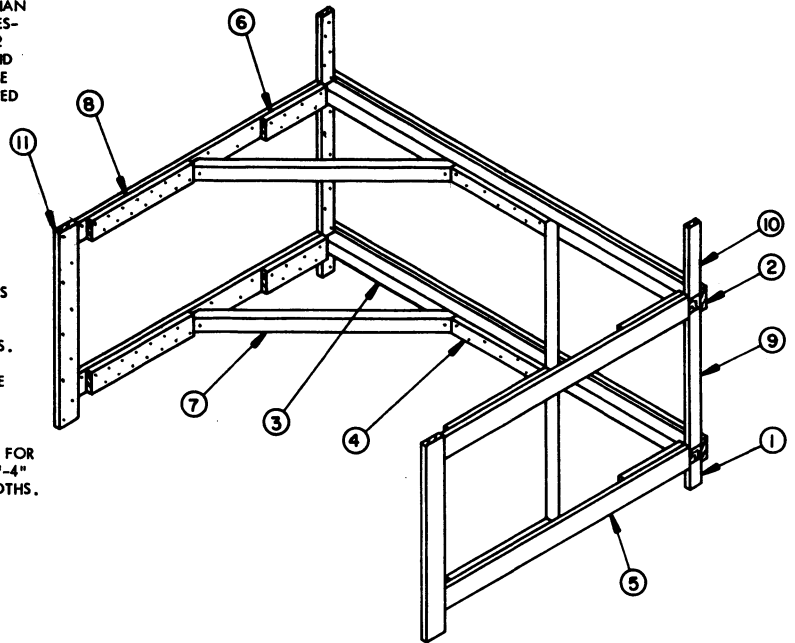
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TYPICAL LCL LOAD USING K-BRACE METHOD OF PARTIAL-LAYER BRACING

SPECIAL NOTES:

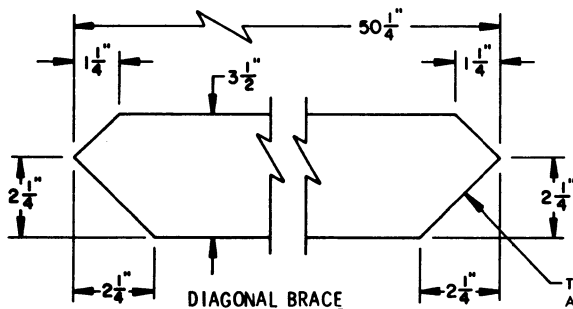
1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. THIS WILL BE NOT MORE THAN EIGHT (8) 5-LAYER UNITS OR EIGHT (8) 6-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 52 AND 53 FOR SELECTION OF THE APPLICABLY SIZED 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 50 MAY BE USED.
2. **CAUTION:** SOME CARS ARE NOT SUITED FOR THE APPLICATION OF "PARTIAL LAYER BRACING" BECAUSE THE LENGTH OF THE PARTIAL TIER TO BE SHIPPED AND/OR THE SIZE OR CONFIGURATION OF THE CAR DOORS WILL NOT PERMIT PROPER INSTALLATION OF THE SPECIFIED K-BRACE DUNNAGE. PIECES MARKED ①, ②, ③, ④, ⑤, ⑥, ⑦, ⑧, ⑨, ⑩, AND ⑪ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF THE 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" CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 50 FOR A TYPICAL INSTALLATION OF A K-BRACE.



ISOMETRIC VIEW

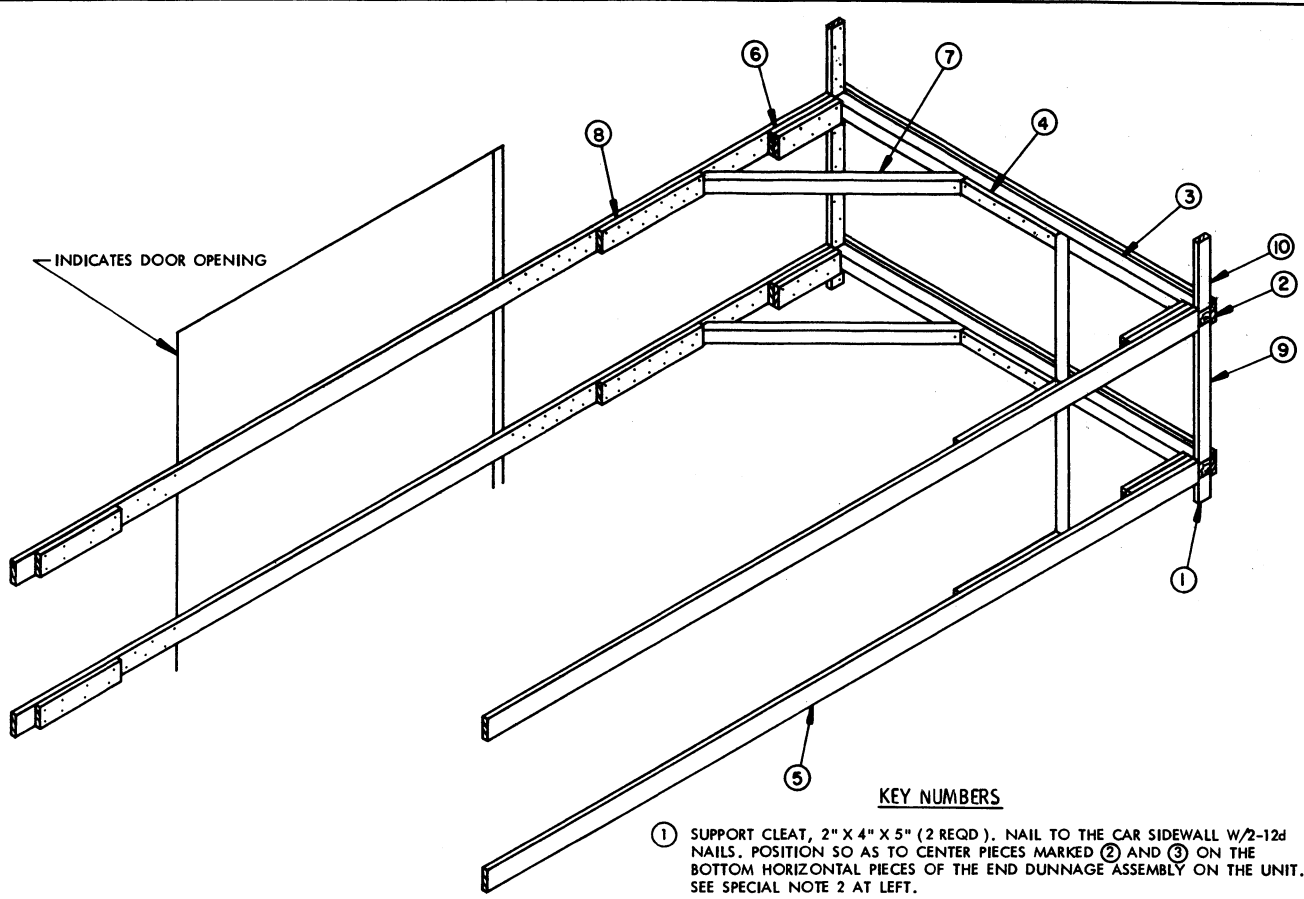
KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 5" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE BOTTOM HORIZONTAL PIECE OF THE END DUNNAGE ASSEMBLY ON THE UNIT. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" X 72" (4 REQD). NAIL TO THE CAR SIDEWALL W/16-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 36-1/2" FOR 6-LAYER UNITS AND 29-1/2" FOR 5-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



SEE SPECIAL NOTE 2 ABOVE

TYPE "B" K-BRACE



ISOMETRIC VIEW

KEY NUMBERS

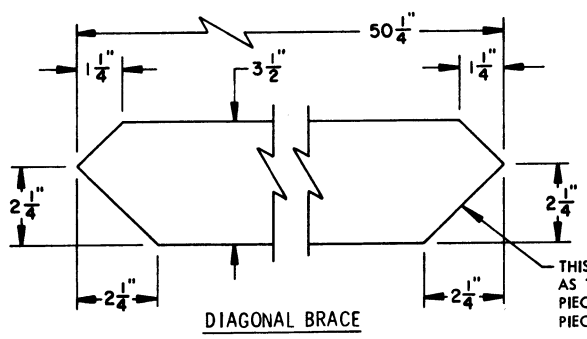
- ① SUPPORT CLEAT, 2" X 4" X 5" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES MARKED ② AND ③ ON THE BOTTOM HORIZONTAL PIECES OF THE END DUNNAGE ASSEMBLY ON THE UNIT. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/7-16d NAILS. SEE SPECIAL NOTE 3 BELOW.
- ⑤ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENINGS TO CONTACT PIECE MARKED ③ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑥ POCKET CLEAT, 2" X 6" X 18" (DOUBLED) (4 REQD). NAIL THE FIRST PIECE TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑦ DIAGONAL BRACE, 4" X 4" X 50-1/4" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE CROSS CAR BRACE, PIECE MARKED ③ AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/1-60d NAIL AT EACH END.
- ⑧ BACK-UP CLEAT, 2" X 6" X 30" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑤, W/14-16d NAILS.
- ⑨ SPACER CLEAT, 2" X 4" X 36-1/2" FOR 6-LAYER UNITS AND 29-1/2" FOR 5-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑩ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

1. THE TYPE "C" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 20,000 POUNDS. THIS WILL BE NOT MORE THAN TEN (10) 6-LAYER UNITS OR TWELVE (12) 5-LAYER UNITS. IF IT IS NECESSARY TO BLOCK A HEAVY LOAD, REFER TO THE DETAIL ON PAGE 53 FOR THE APPLICABLY SIZED K-BRACE TO USE AND 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 51 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 50 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, ⑤, 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.

(SPECIAL NOTES CONTINUED AT BOTTOM RIGHT)

(SPECIAL NOTES CONTINUED)

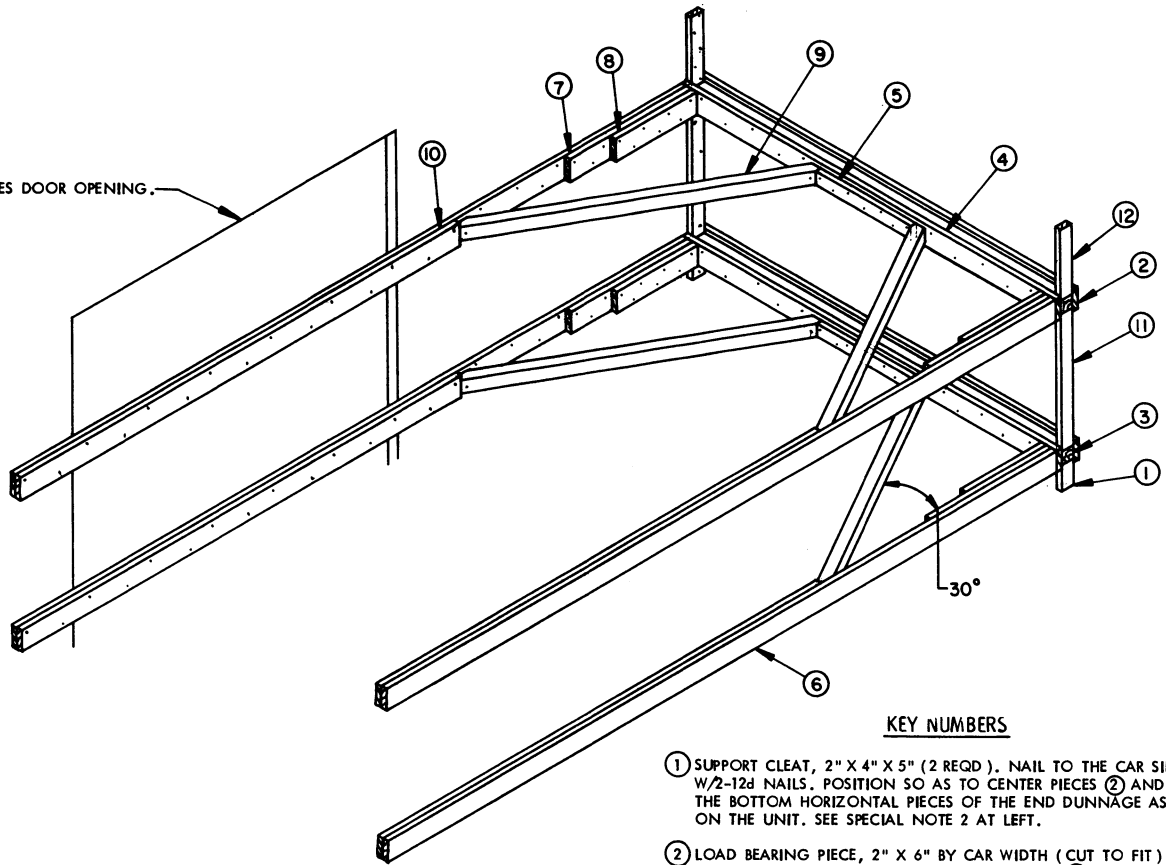


THIS BEARING SURFACE MUST BE POSITIONED SO AS TO BE IN CONTACT WITH A CROSS CAR BRACE, PIECE MARKED ③, OR A HORIZONTAL WALL CLEAT, PIECE MARKED ⑤.

SEE SPECIAL NOTE 2 ABOVE

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" CAR, AND 38" LONG FOR A 9'-4" 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.

INDICATES DOOR OPENING.



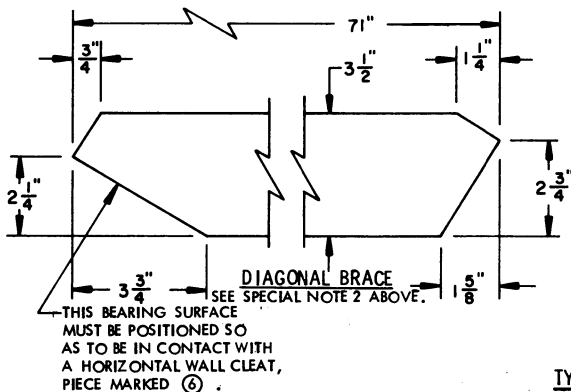
ISOMETRIC VIEW

KEY NUMBERS

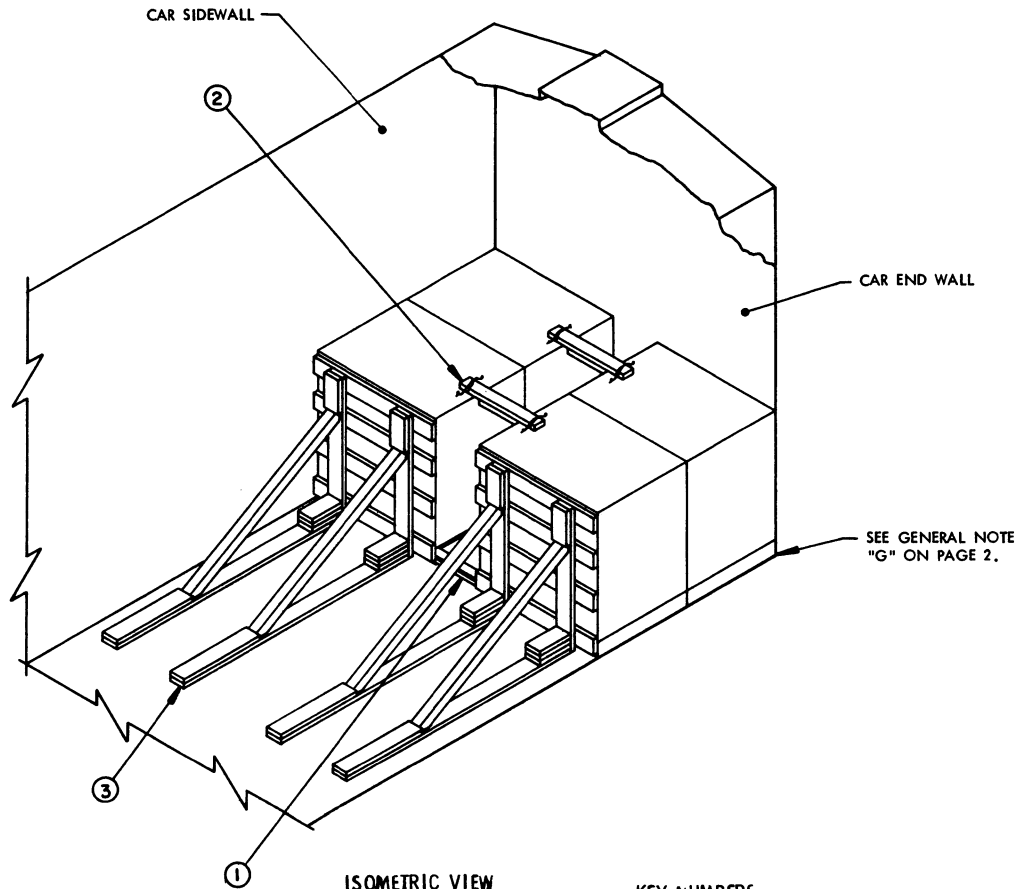
- ① SUPPORT CLEAT, 2" X 4" X 5" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. POSITION SO AS TO CENTER PIECES ② AND ③ ON THE BOTTOM HORIZONTAL PIECES OF THE END DUNNAGE ASSEMBLY ON THE UNIT. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "M" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" X 4" BY CAR WIDTH (CUT TO FIT) (2 REQD).
- ④ HORIZONTAL PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6".
- ⑤ CENTER CLEAT, 2" X 4" X 36" (2 REQD). NAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, W/7-16d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- ⑥ HORIZONTAL WALL CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND ACROSS AND FAR ENOUGH PAST THE DOOR OPENING TO CONTACT PIECE MARKED ④ OF THE K-BRACE IN THE OPPOSITE END OF THE CAR. NAIL TO THE CAR SIDEWALL W/40-12d NAILS.
- ⑦ POCKET CLEAT, 2" X 6" X 36" (4 REQD). NAIL TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/10-16d NAILS.
- ⑧ POCKET CLEAT, 2" X 6" X 24" (4 REQD). NAIL TO THE POCKET CLEAT, PIECE MARKED ⑦, W/7-16d NAILS.
- ⑨ DIAGONAL BRACE, 4" X 4" X 71" (4 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE HORIZONTAL PIECE, PIECE MARKED ④, AND TO THE HORIZONTAL WALL CLEAT, PIECE MARKED ⑥, W/1-60d NAIL AT EACH END.
- ⑩ BACK-UP CLEAT, 2" X 6" BY CUT TO FIT (4 REQD). A CLEAT WILL BE OF A LENGTH AS NECESSARY TO EXTEND 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 36-1/2" FOR 6-LAYER UNITS AND 29-1/2" FOR 5-LAYER UNITS (2 REQD). NAIL TO THE CAR SIDEWALL W/4-12d NAILS.
- ⑫ HOLD DOWN CLEAT, 2" X 4" X 18" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS.

SPECIAL NOTES:

1. THE TYPE "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. THIS WILL BE NOT MORE THAN FOURTEEN (14) 6-LAYER UNITS OR SIXTEEN (16) 5-LAYER UNITS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 52 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS, TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 51 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 50 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 ④ 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 ④ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



TYPE "D" K-BRACE



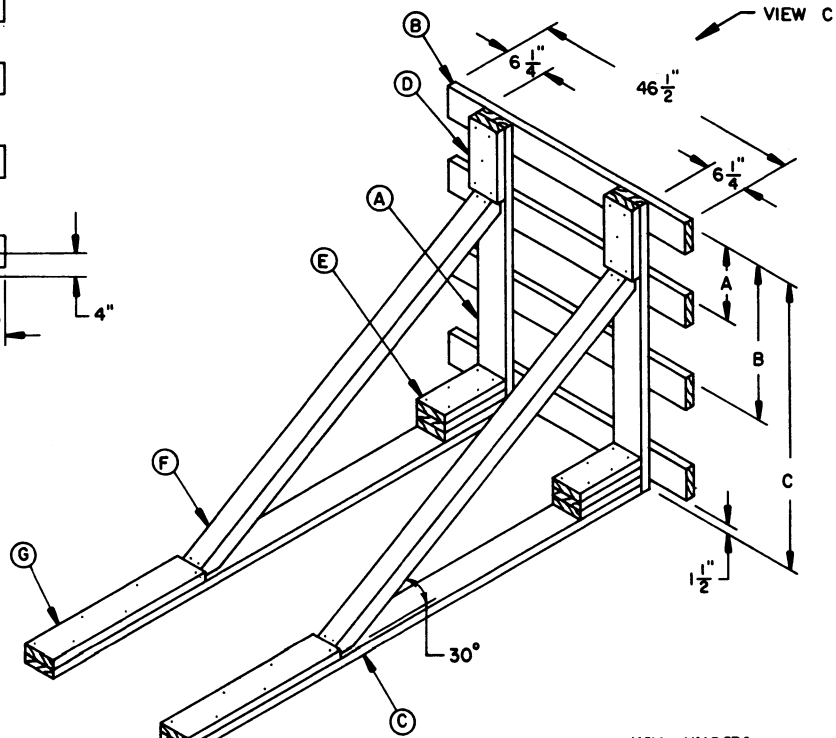
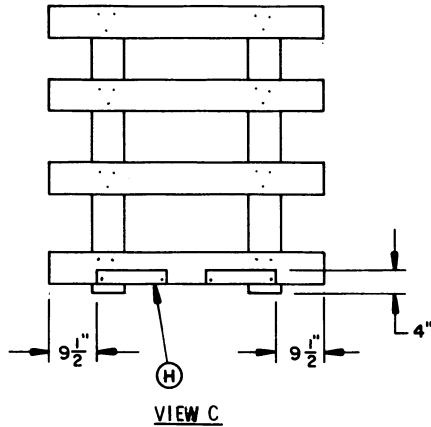
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY B" DETAIL ON PAGE 19. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLET UNITS. SEE GENERAL NOTE "M" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE B" DETAIL ON PAGE 19. WIRE TIE TO CROSS PIECES OF TOP DUNNAGE ASSEMBLY OF UNIT WITH NO. 14 GAGE WIRE AS SHOWN BY THE "TIE WIRE APPLICATION B" DETAIL ON PAGE 63.
- ③ KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 55 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.

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 LINING CAN BE USED.
- 2. THE BASIC HEIGHT PALLET UNIT IS SHOWN ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
- 3. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING FOR LENGTHWISE POSITIONED CONTAINERS 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. KNEE BRACE ASSEMBLIES WILL NOT BE USED AGAINST THE NARROW DIMENSION OF THE PALLET UNIT (CONTAINERS CROSSWISE).
- 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. FOR HOLD-DOWN PIECES TO BE APPLIED TO THE KNEE BRACE ASSEMBLY, REFER TO THE KNEE BRACE ASSEMBLY DETAIL "VIEW C" ON PAGE 57.

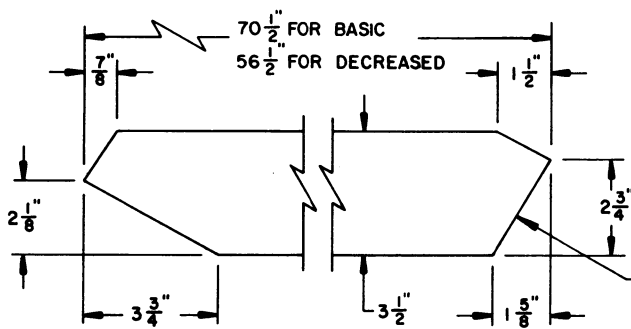


KNEE BRACE ASSEMBLY

KEY NUMBERS

HORIZONTAL PIECE PLACEMENT FOR LENGTHWISE CONTAINERS			
PALLET UNIT	DIM A	DIM B	DIM C
BASIC HEIGHT	12-1/2"	27"	50"
DECREASED HEIGHT	12-1/2"	19"	43"

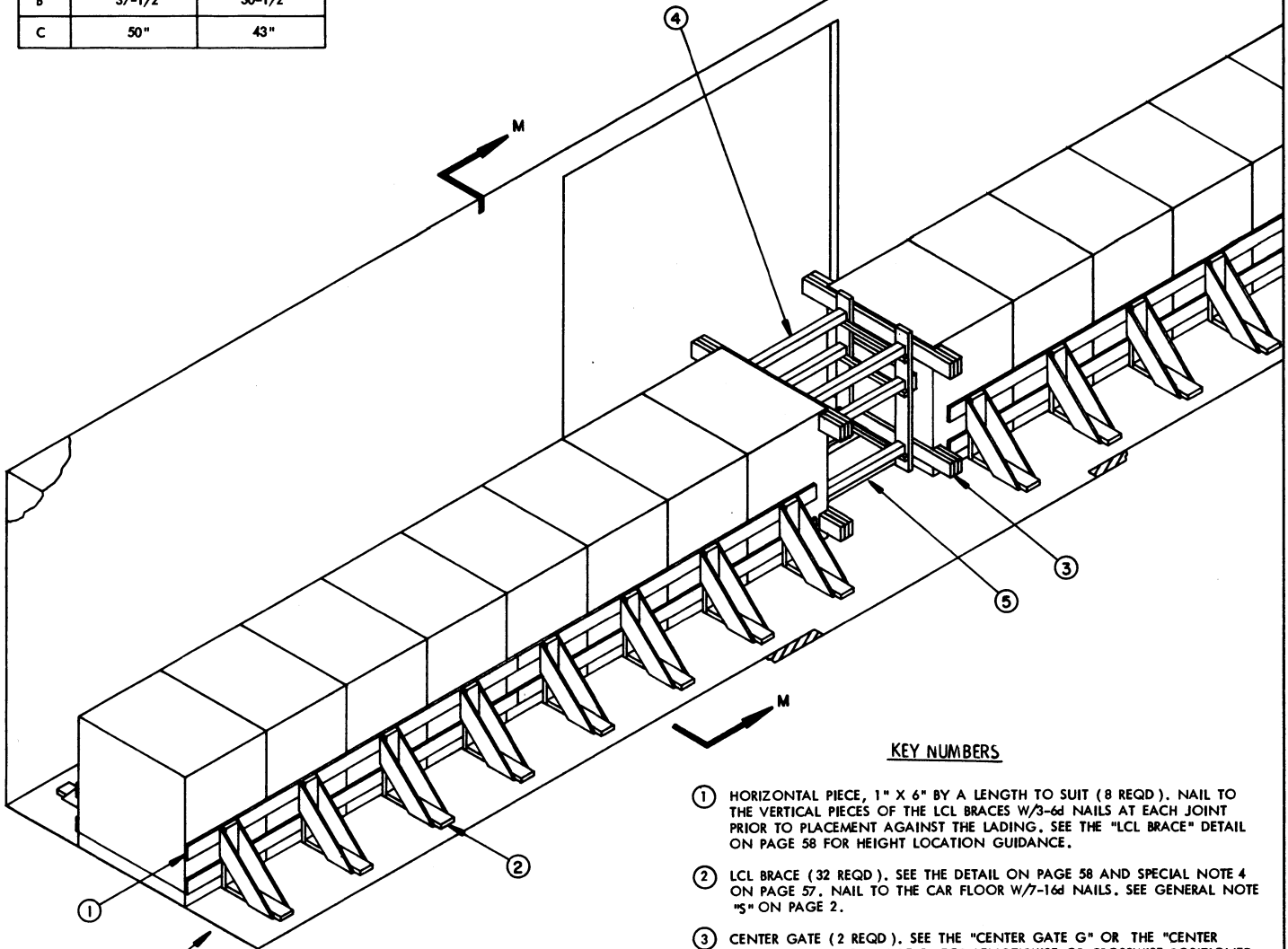
- (A) VERTICAL PIECE, 2" X 6" BY DIMENSION C (SEE CHART AT LEFT) (2 REQD). SEE THE VIEW ABOVE FOR PLACEMENT DIMENSIONS.
- (B) HORIZONTAL PIECE, 2" X 6" X 46-1/2" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE GENERAL NOTE "M" ON PAGE 2.
- (C) FLOOR CLEAT, 2" X 6" BY LENGTH TO SUIT (.87 OR 7/8 TIMES LENGTH OF PIECE MARKED (F), PLUS 30") (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8". SEE GENERAL NOTE "S" ON PAGE 2.
- (D) HOLD-DOWN CLEAT, 2" X 6" X 13-1/4" (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, 70-1/2" FOR BASIC HEIGHT UNIT OR 56-1/2" FOR DECREASED (2 REQD). SEE THE DETAIL BELOW FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH END.
- (G) BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT, PIECE MARKED (C), W/6-40d NAILS.
- (H) HOLD-DOWN CLEAT, 2" X 3" X 10" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE BOTTOM HORIZONTAL PIECE W/2-10d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE SPECIAL NOTE 5 ON PAGE 56.



BRACE
4" X 4" MATERIAL

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

CENTER GATE G		
DIM	6-HIGH UNIT	5-HIGH UNIT
A	54"	47"
B	37-1/2"	30-1/2"
C	50"	43"

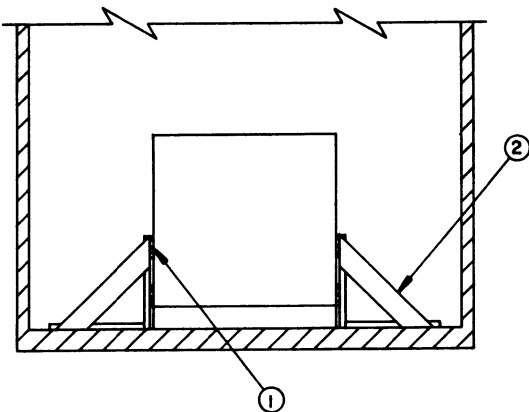


SEE GENERAL NOTE "G" ON PAGE 2.

ISOMETRIC VIEW

KEY NUMBERS

- ① HORIZONTAL PIECE, 1" X 6" BY A LENGTH TO SUIT (8 REQD). NAIL TO THE VERTICAL PIECES OF THE LCL BRACES W/3-6d NAILS AT EACH JOINT PRIOR TO PLACEMENT AGAINST THE LADING. SEE THE "LCL BRACE" DETAIL ON PAGE 58 FOR HEIGHT LOCATION GUIDANCE.
- ② LCL BRACE (32 REQD). SEE THE DETAIL ON PAGE 58 AND SPECIAL NOTE 4 ON PAGE 57. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "5" ON PAGE 2.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE G" OR THE "CENTER GATE H" DETAIL ON PAGE 57 FOR LENGTHWISE OR CROSSWISE-POSITIONED CONTAINERS, RESPECTIVELY.
- ④ STRUT, 4" X 4" BY CUT TO FIT (6 REQD FOR LENGTHWISE CONTAINERS AND 4 REQD FOR CROSSWISE CONTAINERS). TOENAIL TO PIECE MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "U" AND "V" ON PAGE 2 AND/OR 3.
- ⑤ GATE HOLD DOWN, 2" X 3" BY LENGTH OF CENTER VOID PLUS 24" (2 REQD). NAIL TO THE VERTICAL PIECES OF THE CENTER GATES W/2-10d NAILS AT EACH JOINT. SEE THE "CENTER GATE G" DETAIL ON PAGE 57 FOR LOCATION GUIDANCE. SEE SPECIAL NOTE 6 ON PAGE 57.



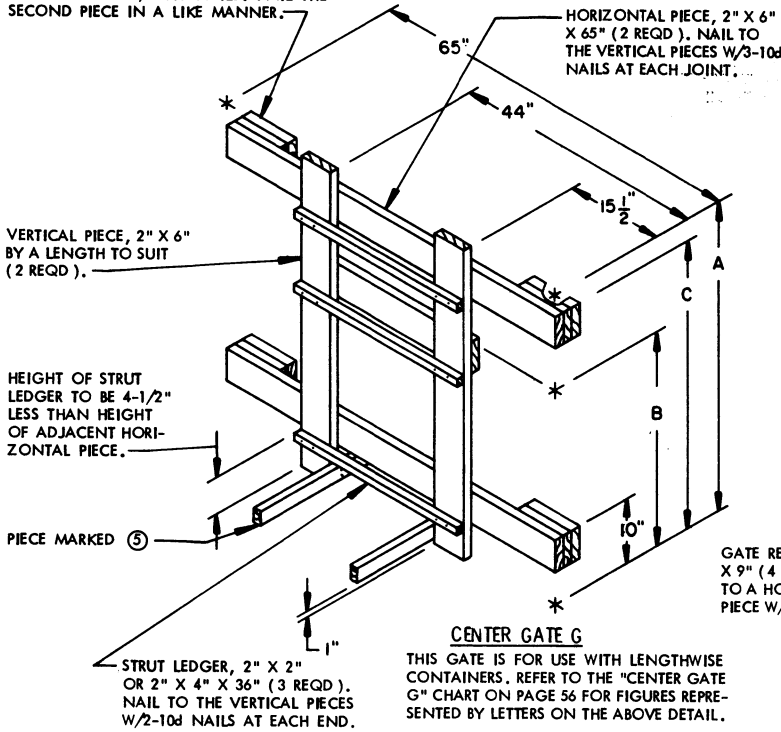
SECTION M-M

CENTER GATE H		
DIM	6-HIGH UNIT	5-HIGH UNIT
D	49"	34"
E	30"	--
F	44-1/2"	30"

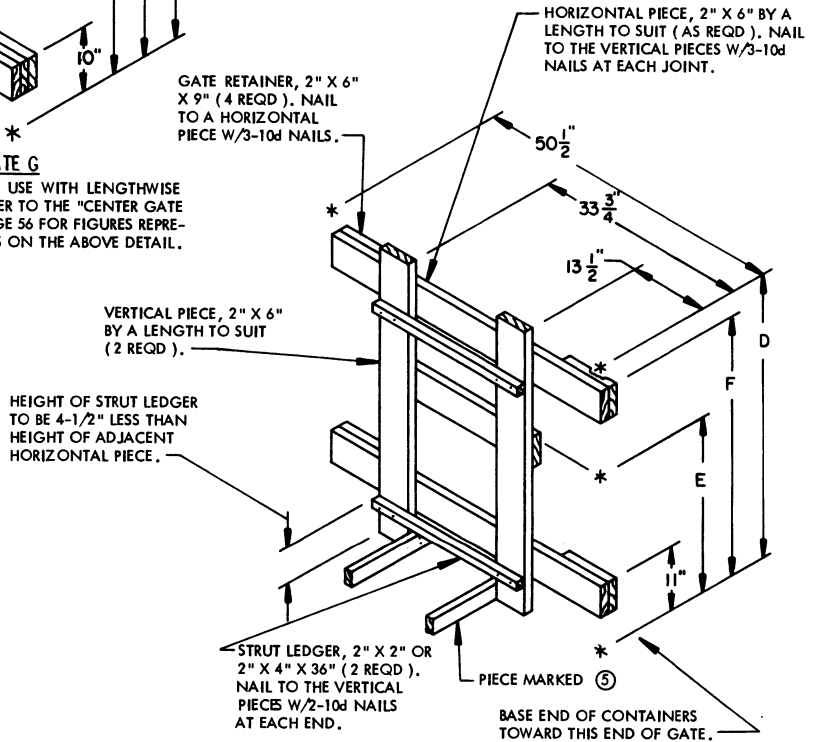
SPECIAL NOTES:

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 BASIC HEIGHT PALLET UNIT IS SHOWN IN THE TYPICAL 1-WIDE LOAD ON PAGE 56. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
3. A 1-WIDE LENGTHWISE CONTAINERS LOAD IS SHOWN AS TYPICAL. A CHART IS GIVEN TO SPECIFY THE PROPER DIMENSIONS FOR THE POSITIONING OF PIECES FOR THE CENTER GATES. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR 1-WIDE CROSSWISE CONTAINERS LOADS FOR WHICH THERE IS ALSO A CHART WHICH SPECIFIES POSITIONING OF PIECES FOR THE CENTER GATES. NOTE THAT THE QUANTITY OF LCL BRACES, PIECES MARKED (5), IS NOT CORRECT FOR CROSSWISE CONTAINERS LOADS.
4. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH PALLET UNIT. FOR BOTH LENGTHWISE AND CROSSWISE POSITIONED CONTAINERS THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE LENGTH OR WIDTH OF THE UNIT.
5. THE BILL OF MATERIAL AND LOAD AS SHOWN ARE BASED ON THE DEPICTED UNIT AND THEREFORE ARE ONLY TYPICAL.
6. IF DESIRED, GATE HOLD DOWN PIECES WITH THE ASSOCIATED FILL PIECES, AS SHOWN ELSEWHERE ON THE APPLICABLE CENTER GATES, MAY BE USED IN LIEU OF PIECES MARKED (5). NOTE THAT ALL CENTER GATES DEPICTED IN THIS DOCUMENT ARE FOR 2 OR 3 WIDE LOADS; IF GATE HOLD DOWN AND FILL PIECES ARE USED THEY MUST BE MODIFIED FOR SINGLE ROW GATES.

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



CENTER GATE G
THIS GATE IS FOR USE WITH LENGTHWISE CONTAINERS. REFER TO THE "CENTER GATE G" CHART ON PAGE 56 FOR FIGURES REPRESENTED BY LETTERS ON THE ABOVE DETAIL.



CENTER GATE H

THIS GATE IS FOR USE WITH CROSSWISE CONTAINERS. REFER TO THE "CENTER GATE H" CHART ON PAGE 56 FOR FIGURE REPRESENTED BY LETTERS ON THE DETAIL ABOVE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	407	204
2" X 2"	15	5
2" X 3"	12	6
2" X 6"	178	178
4" X 4"	20	27
NAILS	NO. REQD	POUNDS
6d (2")	192	1-1/4
8d (2-1/2")	384	6
10d (3")	92	1-1/2
16d (3-1/2")	312	7

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	16	27,440 LBS
DUNNAGE		856 LBS
TOTAL WEIGHT		28,296 LBS

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

HORIZONTAL PIECE, 1" X 6" X 46-1/2"
(2 REQD). NAIL TO THE VERTICAL
PIECES OF THE LCL BRACES W/3-6d
NAILS AT EACH JOINT PRIOR TO
PLACEMENT AGAINST LADING.

HORIZONTAL PIECE, 1" X 6"
X 35" (2 REQD). NAIL TO
THE VERTICAL PIECES OF THE
LCL BRACES W/3-6d NAILS
AT EACH JOINT PRIOR TO
PLACEMENT AGAINST LADING.

SEE GENERAL NOTE "G" ON PAGE 2.

LCL BRACE (4 REQD). SEE THE DETAIL BELOW.
LOCATE SO AS TO BE CENTERED ON THE
CROSS PIECES OF THE INTERMEDIATE DUNNAGE
PIECES OR CENTER ON THE VERTICAL PIECES OF
THE DUNNAGE GATE, AS APPLICABLE. NAIL TO
THE CAR FLOOR W/7-16d NAILS. SEE GENERAL
NOTES "M" AND "S" ON PAGE 2.

ISOMETRIC VIEW

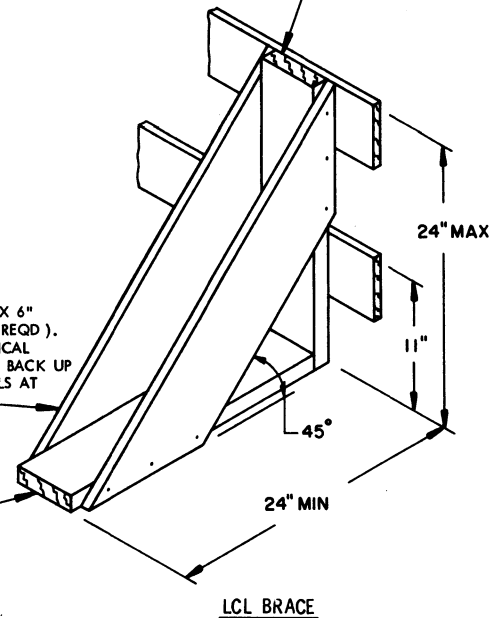
SPECIAL NOTES:

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 "E" AND "S" ON PAGE 2.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
3. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A LENGTHWISE CONTAINERS UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR CROSSWISE CONTAINERS UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 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 IN EITHER DIRECTION.

VERTICAL PIECE, 2" X 6" X 24"
(MAXIMUM) (1 REQD). NAIL
TO THE BACK UP CLEAT W/2-16d
NAILS.

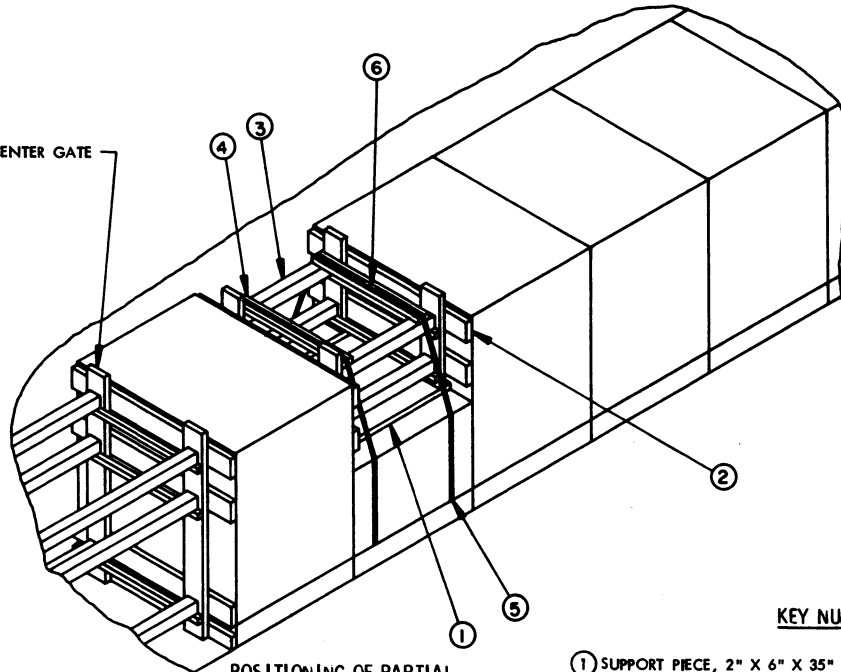
ANGLE BRACE, 1" X 6"
BY CUT TO FIT (2 REQD).
NAIL TO THE VERTICAL
PIECE AND TO THE BACK UP
CLEAT W/3-8d NAILS AT
EACH END.

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



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

INDICATES TYPICAL CENTER GATE



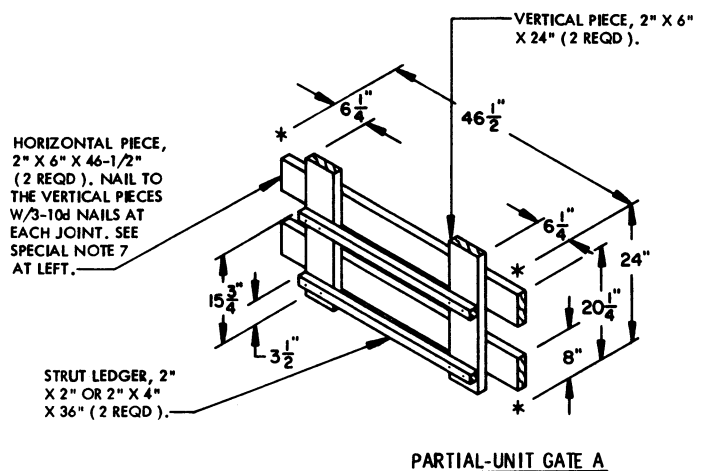
POSITIONING OF PARTIAL LENGTHWISE-CONTAINERS UNIT WITHIN A LAYER

SPECIAL NOTES:

1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LENGTHWISE-CONTAINERS LOAD.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
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 3-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/20-20PM1001, MUST BE INSTALLED IN THE PLACE OF OMITTED CONTAINER (5).
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 AND DUNNAGE MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
6. THE "POSITIONING OF PARTIAL LENGTHWISE CONTAINERS 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. AS REQUIRED, 1" THICK FILL PIECES WILL BE APPLIED TO THE END DUNNAGE ASSEMBLY OF THE UNIT TO PROVIDE FOR PROPER BEARING OF THE PARTIAL-UNIT GATE AGAINST THE PALLET UNIT.

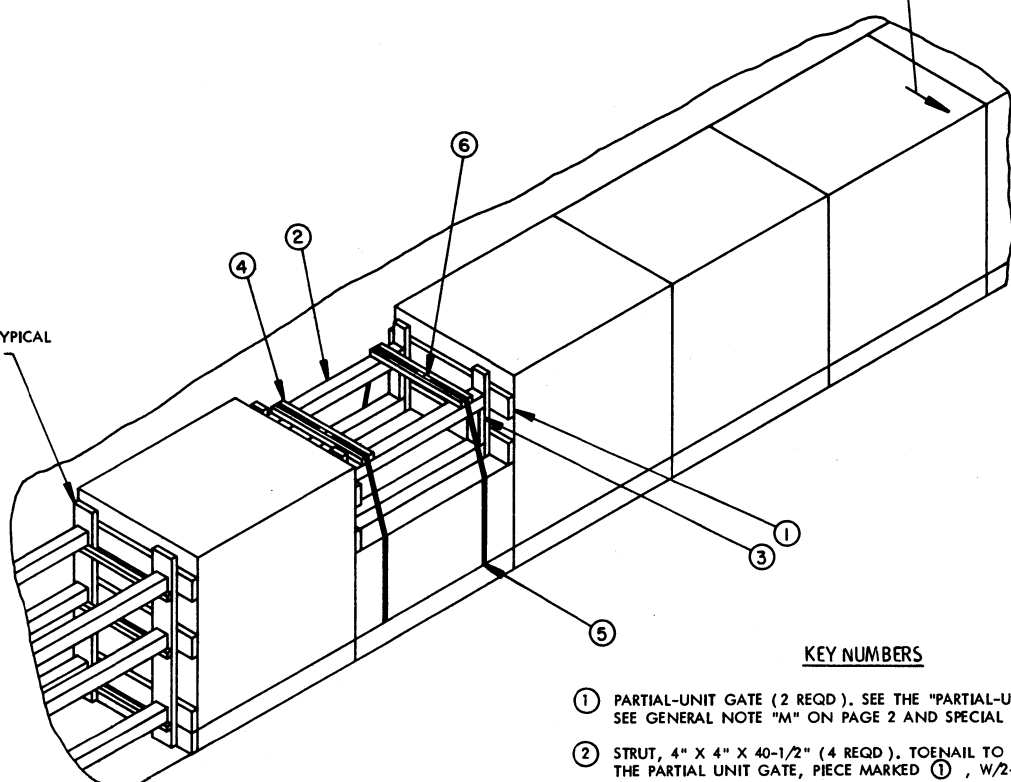
KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 35" (2 REQD). POSITION ON TOP OF THE CROSS PIECES OF THE TOP DUNNAGE ASSEMBLY SO AS TO ALIGN WITH THE VERTICAL PIECES OF THE PARTIAL UNIT GATES, PIECE MARKED ②.
- ② PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE A" DETAIL BELOW. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ③ STRUT, 4" X 4" X 29" (4 REQD). TOENAIL TO THE PARTIAL-UNIT GATE, PIECE MARKED ②, W/2-16d NAILS AT EACH END.
- ④ STRAPPING BOARD, 2" X 4" X 32" (2 REQD). NAIL TO THE STRUTS, PIECE MARKED ③, W/3-10d NAILS AT EACH JOINT.
- ⑤ UNITIZING STRAP, 1-1/4" X .035" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION.
- ⑥ SEAL FOR 1-1/4" STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.



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

INDICATES A TYPICAL
CENTER GATE.



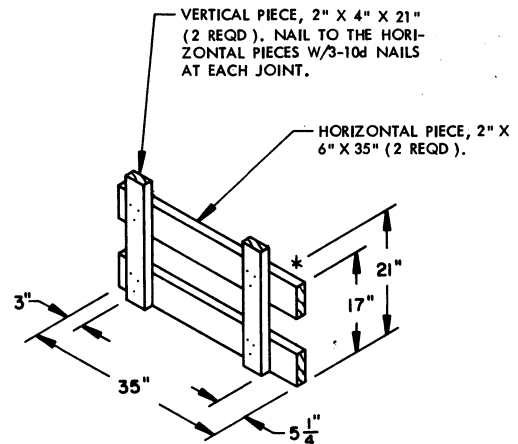
**POSITIONING OF PARTIAL CROSSWISE-
CONTAINERS UNIT WITHIN A LAYER**

SPECIAL NOTES:

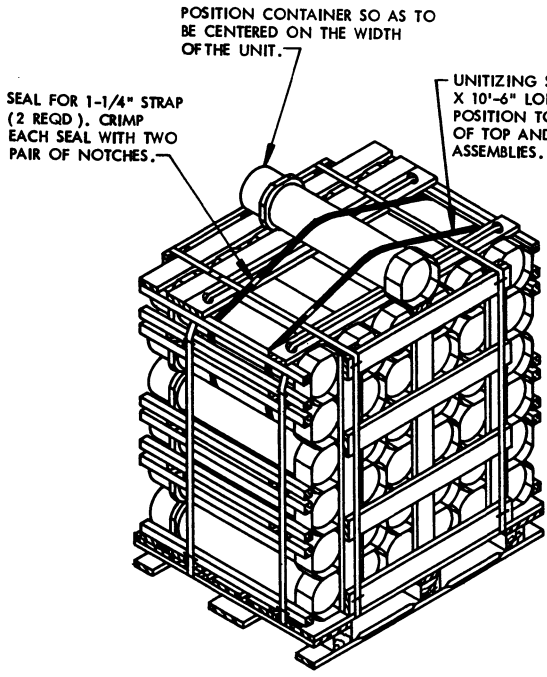
1. SHIPMENT OF PROPELLING CHARGES SHOULD CONSIST OF FULL-HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LESS-THAN-FULL PALLET UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A CROSSWISE-CONTAINERS LOAD.
2. THE BASIC HEIGHT PALLET UNIT IS SHOWN IN THE SHIPMENT OF PARTIAL UNITS VIEW ABOVE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
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 3-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 20-20PM1001, 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 AND DUNNAGE MAY REMAIN WITH THE UNIT DURING STORAGE (IF APPLICABLE) FOR POSSIBLE USE IN A FUTURE SHIPMENT.
6. THE "POSITIONING OF PARTIAL CROSSWISE-CONTAINERS WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
7. FOR THE SHIPMENT OF A PARTIAL UNIT CONSISTING OF ONE OR TWO LAYERS THE PROCEDURES SHOWN ON PAGE 62 MAY BE MORE ECONOMICAL.

KEY NUMBERS

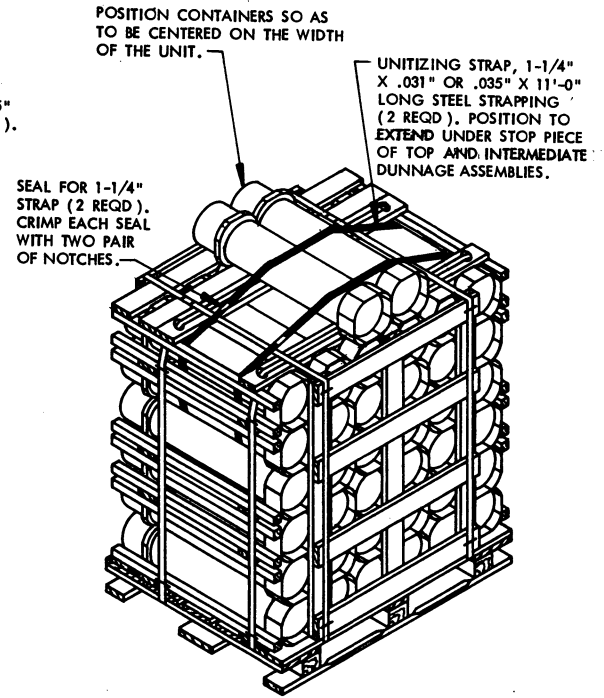
- ① PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE B" DETAIL BELOW. SEE GENERAL NOTE "M" ON PAGE 2 AND SPECIAL NOTE 3 AT LEFT.
- ② STRUT, 4" X 4" X 40-1/2" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ STRUT SUPPORT PIECE, 2" X 4" X 9" (4 REQD). NAIL TO A VERTICAL PIECE OF THE PARTIAL-UNIT GATE W/3-10d NAILS.
- ④ STRAPPING BOARD, 2" X 4" X 26-3/4" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ③, W/3-10d NAILS AT EACH END.
- ⑤ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE PALLET.
- ⑥ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "O" ON PAGE 2.



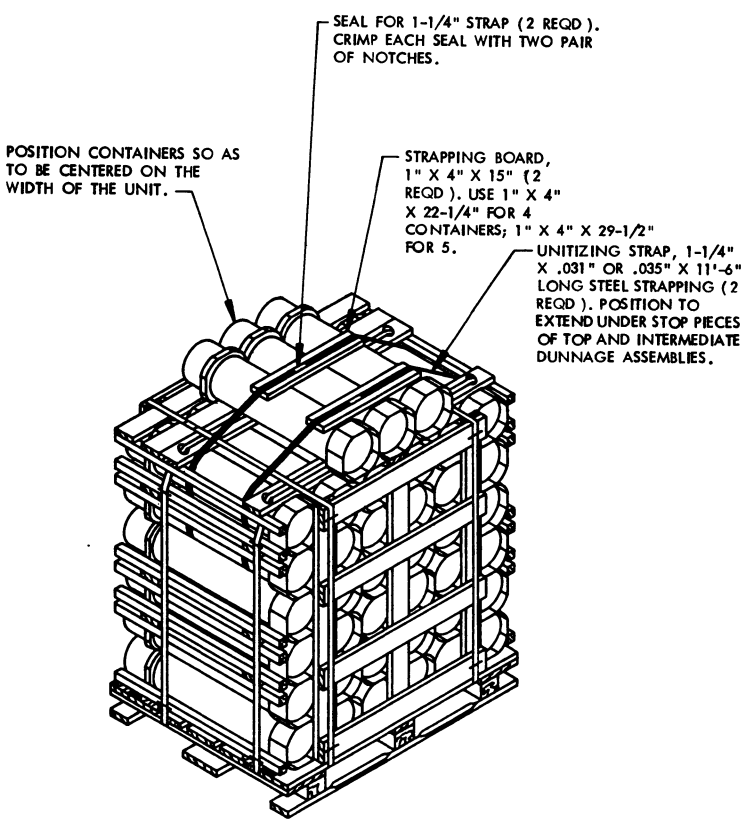
PARTIAL-UNIT GATE B



SECUREMENT OF ONE CONTAINER



SECUREMENT OF TWO CONTAINERS



SECUREMENT OF THREE CONTAINERS

SPECIAL NOTES:

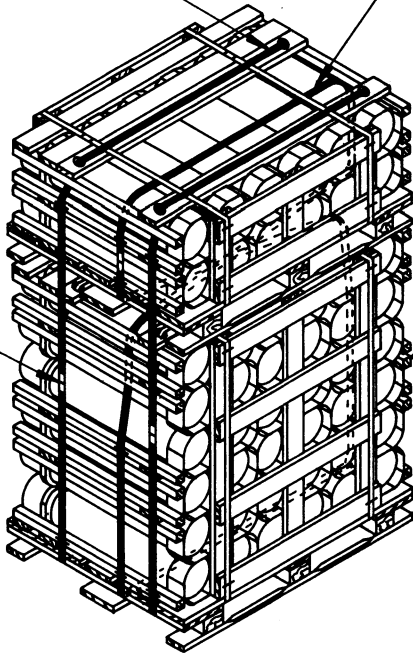
1. SHIPMENTS OF PROPELLING CHARGES SHOULD CONSIST OF FULL HEIGHT AND FULL-LAYER UNITS TO THE MAXIMUM EXTENT POSSIBLE. HOWEVER, THE END OF A LOT, OR THE QUANTITY OF ITEMS NEEDED TO FILL A REQUISITION, MAY NECESSITATE THE SHIPMENT OF ONE OR MORE LEFTOVER CONTAINERS. LEFTOVER CONTAINERS ARE DESCRIBED AS 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 62 OR WITHIN A LAYER AS SHOWN ON PAGES 59 AND 60.
2. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOT TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLY, AND PACK PLANTS TO DEPOTS. **CAUTION:** A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
3. THE BASIC HEIGHT PALLET UNIT IS SHOWN ON THIS PAGE. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.
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 WOULD 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.

VERTICAL UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). POSITION OVER THE EXISTING LOAD STRAPS OF THE PALLETS AS SHOWN.

FIGURE-8 UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (1 REQD). POSITION NEAR THE CENTER OF THE UNIT LENGTH. NOTE THAT THE STRAP PASSES UNDER THE DECKING BOARDS OF THE PALLET AND EXTENDS BEHIND THE STOP PIECES OF THE TOP DUNNAGE ASSEMBLIES, AND BEHIND THE UPPER INTERMEDIATE DUNNAGE ASSEMBLY OF THE LOWER PALLET UNIT.

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

A BASIC HEIGHT UNIT IS SHOWN AS TYPICAL. THE DEPICTED PROCEDURES ARE ALSO APPLICABLE FOR THE DECREASED HEIGHT UNIT.

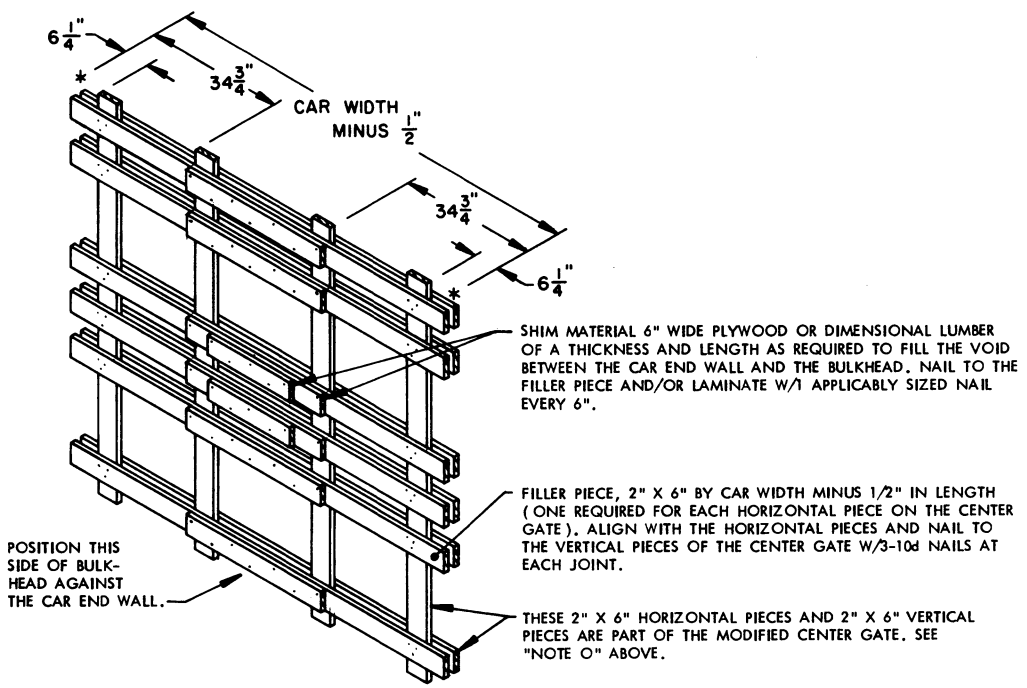


SECUREMENT OF PARTIAL UNIT ON TOP

THIS PROCEDURE IS APPLICABLE FOR USE IN A CONTAINERS-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 59 OR 60.

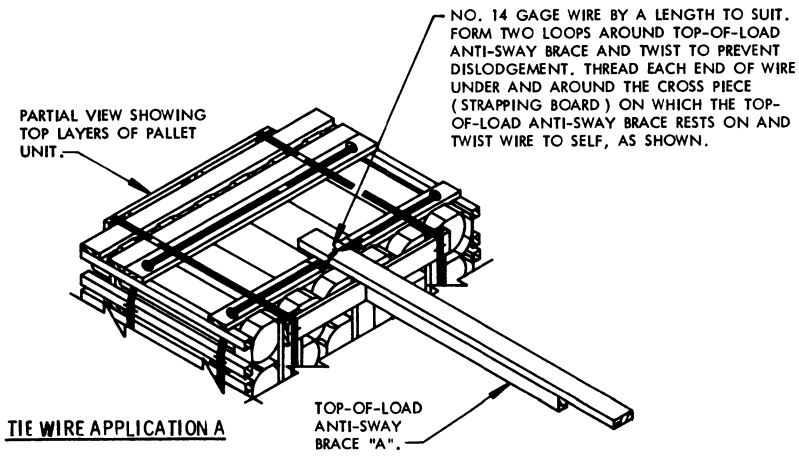
NOTE O:

IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE TO SIDE OR FROM FLOOR TO ROOF, AN END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "C" AS DETAILED ON PAGE 18, IS SHOWN AS TYPICAL.

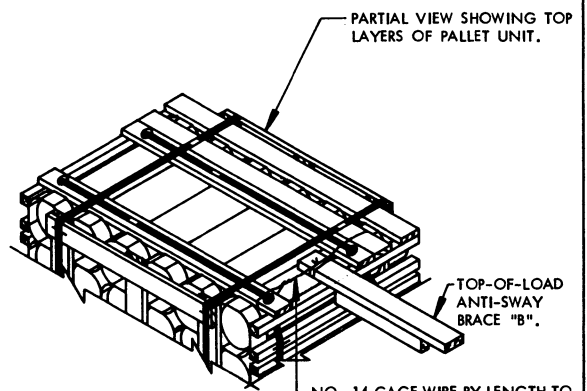


END-OF-CAR BULKHEAD

SEE "NOTE O" AT RIGHT.

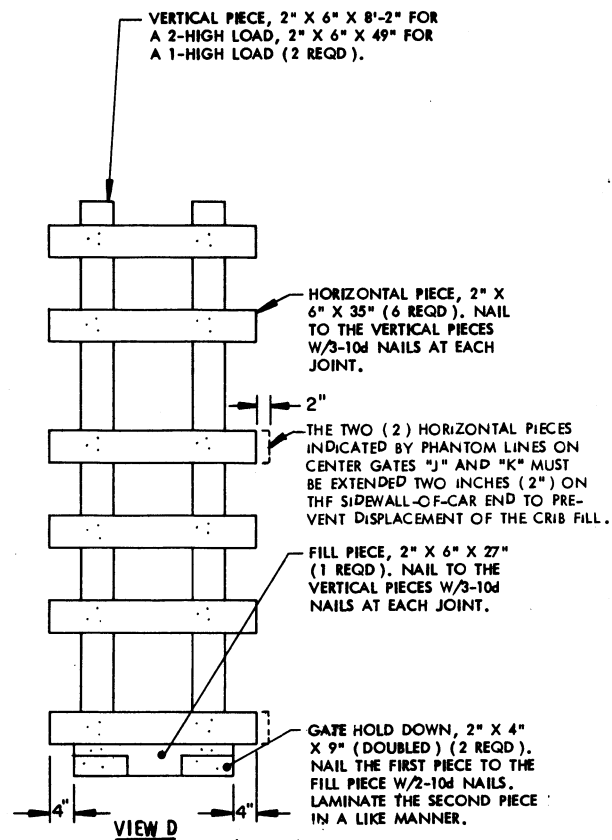
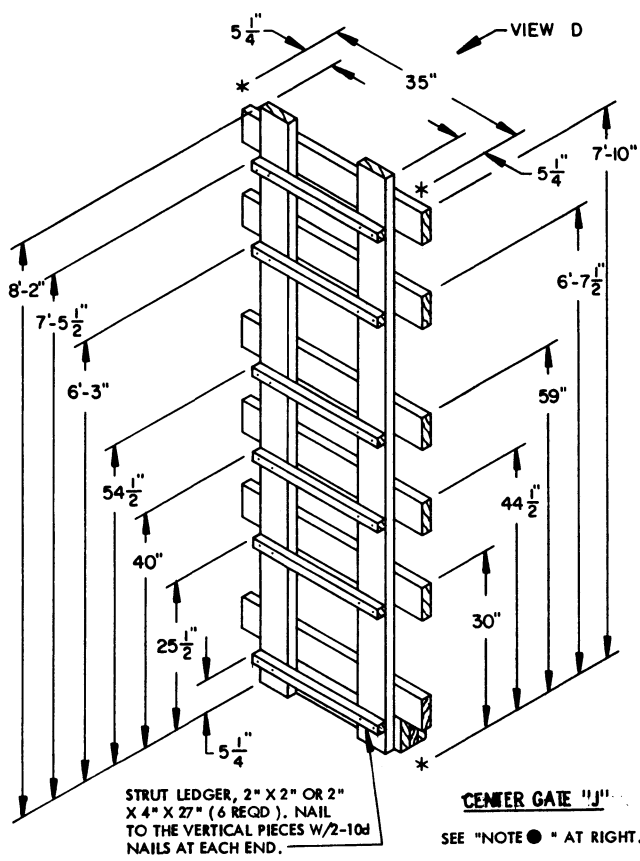


TIE WIRE APPLICATION A

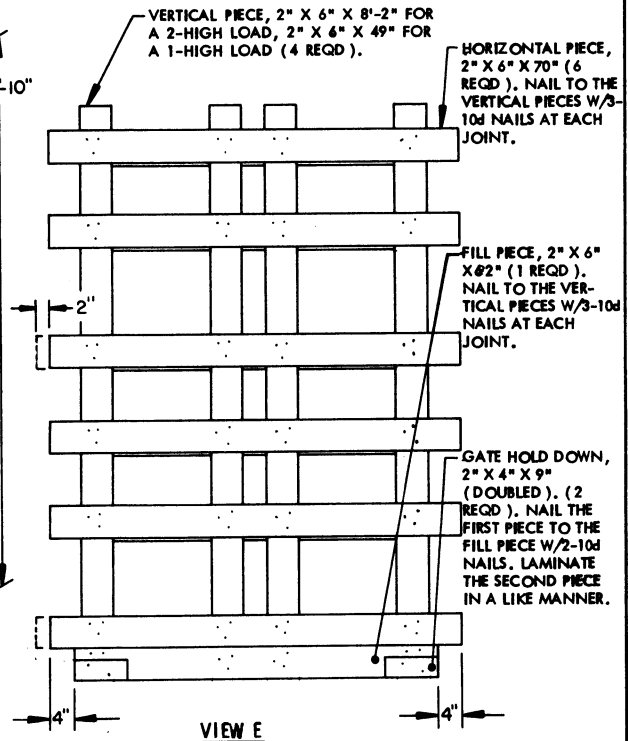
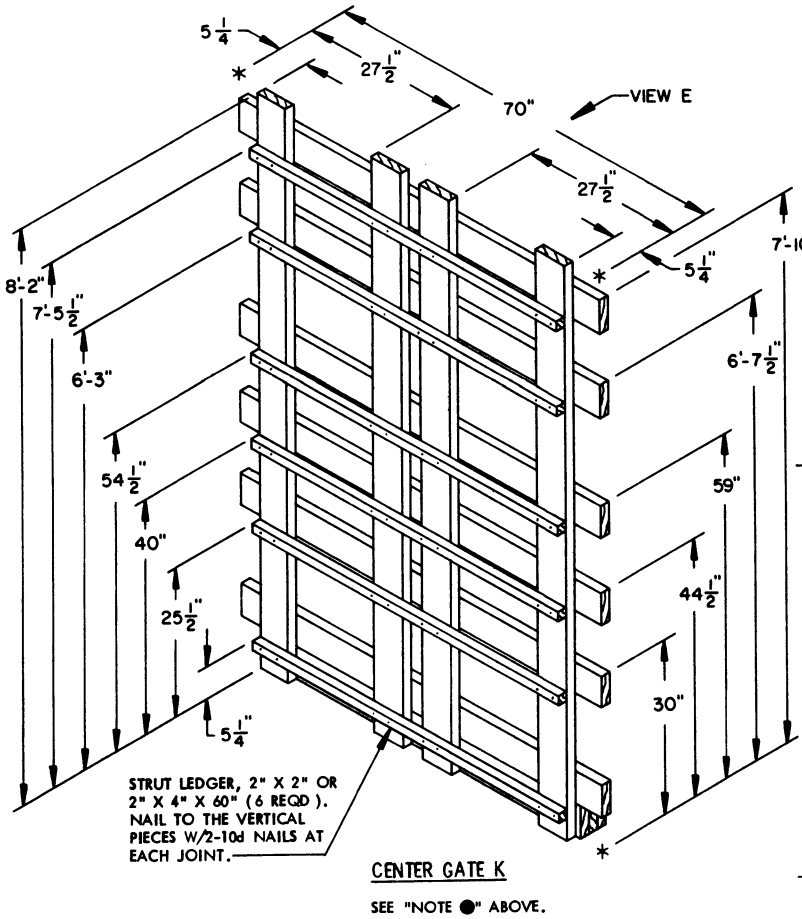


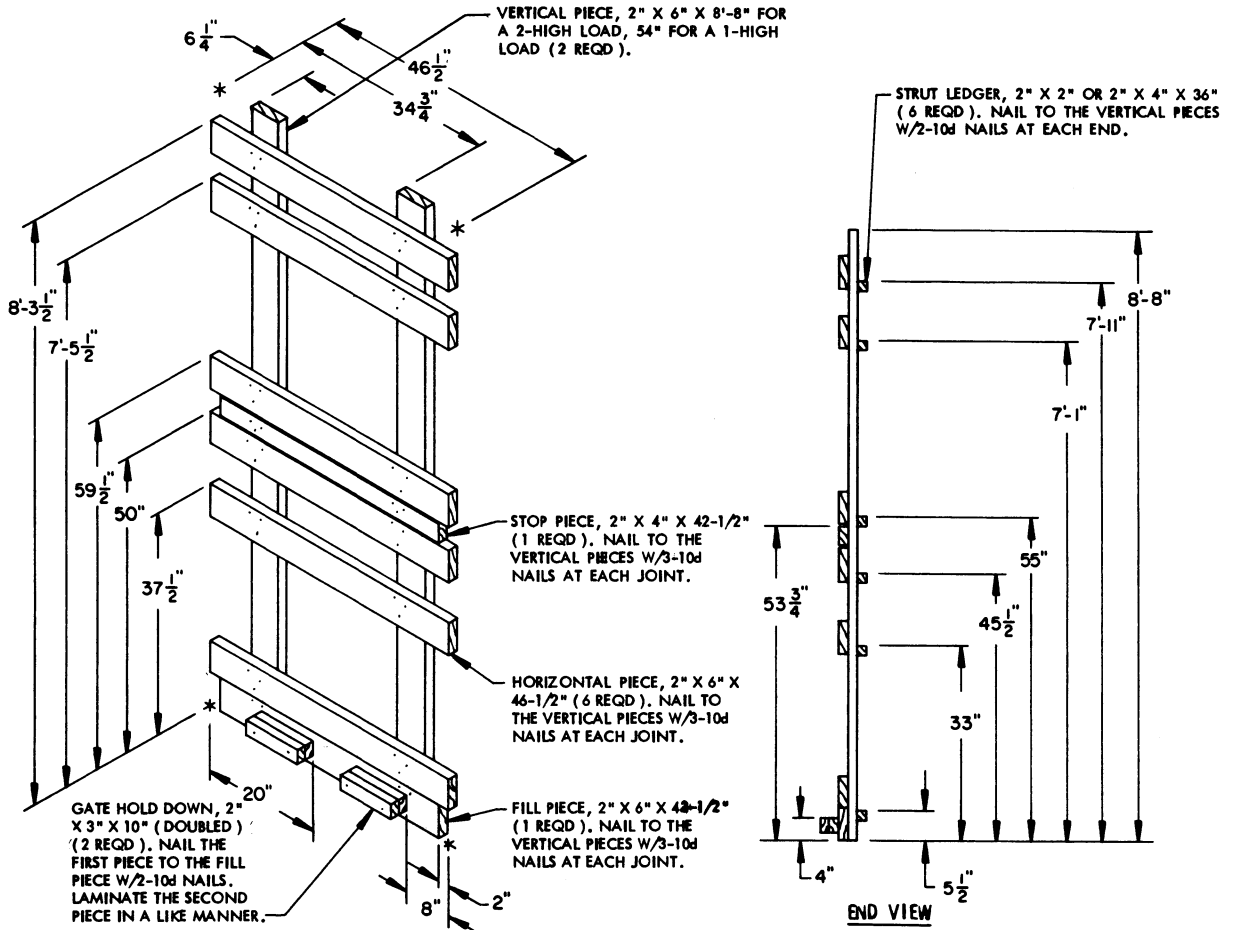
TIE WIRE APPLICATION B

DETAILS



NOTE ● :
 THE DIMENSIONS FOR THE LOCATION OF THE HORIZONTAL PIECES AND THE STRUT LEDGERS ARE APPLICABLE FOR THE BASIC HEIGHT UNIT. REFER TO "CENTER GATE D" DETAIL ON PAGE 30 FOR DIMENSIONS APPLICABLE TO THE DECREASED HEIGHT UNIT. ADJUST GATES AS NECESSARY TO ACCOMMODATE A 5-UNIT LOAD UNIT.

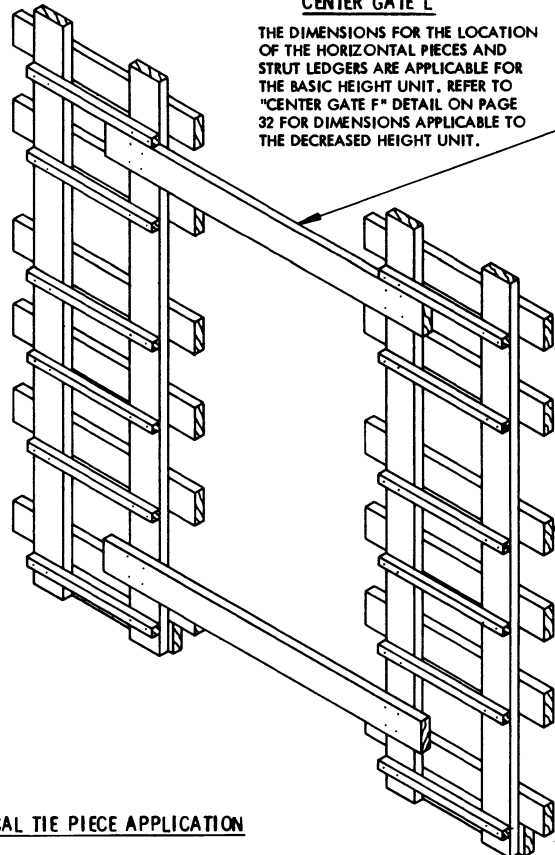




CENTER GATE L

THE DIMENSIONS FOR THE LOCATION OF THE HORIZONTAL PIECES AND STRUT LEDGERS ARE APPLICABLE FOR THE BASIC HEIGHT UNIT. REFER TO "CENTER GATE F" DETAIL ON PAGE 32 FOR DIMENSIONS APPLICABLE TO THE DECREASED HEIGHT UNIT.

TIE PIECE, 2" X 6" BY A LENGTH TO SUIT (REF: 66" FOR A 2-WIDE LOAD OF CROSSWISE CONTAINERS, 32" FOR A 3-WIDE LOAD OF CROSSWISE CONTAINERS, 45" FOR A 2-WIDE LOAD OF LENGTHWISE CONTAINERS) (2 REQD.). POSITION UNDER THE UPPER LEVEL OF STRUT LEDGERS AND/OR ABOVE THE LOWER LEVEL OF INSTALLED STRUTS AFTER THE GATES AND STRUTS HAVE BEEN INSTALLED. NAIL TO THE VERTICAL PIECES OF THE GATES W/4-10d NAILS AT EACH END.



TYPICAL TIE PIECE APPLICATION

CENTER GATE "J" SHOWN AS TYPICAL. THE PROCEDURES ARE ALSO APPLICABLE FOR TIEING OF CENTER GATES "K" AND "L".

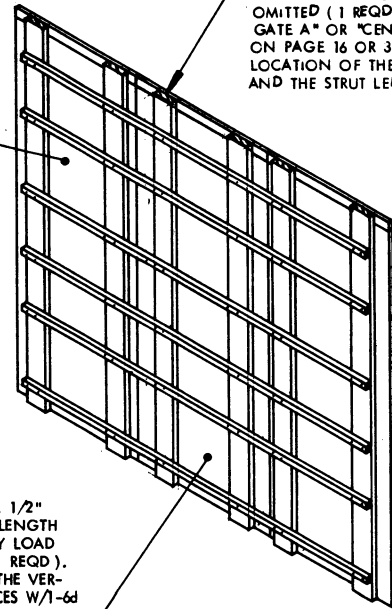
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NOTE ■

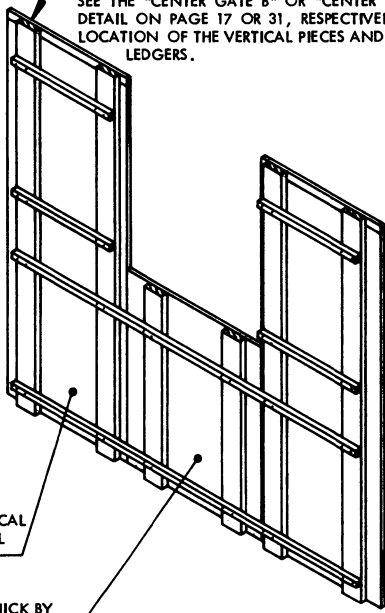
WHEN NAILED FLOORLINE BLOCKING IS USED FOR DOORWAY PROTECTION, THE PLYWOOD SHEETS MUST BE CUT OUT ADJACENT TO THE NAILED BLOCKING TO PROVIDE CLEARANCE DURING THE NORMAL SHIFTING OF THE LOAD. THE CUTOUTS MUST BE 3-1/2" HIGH AND OF A WIDTH AS REQUIRED. FOR THE GATE ALTERNATIVES "A" AND "B" THE PLYWOOD MUST NOT EXTEND BEYOND THE VERTICAL PIECES OF THE GATE; FOR THE GATE ALTERNATIVE "C" THE PLYWOOD AT THE FLOOR SHOULD BE 45" WIDE.

PLYWOOD, 1/2" THICK BY UNIT LENGTH BY LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".

INDICATES A TYPICAL CENTER GATE, WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE "CENTER GATE A" OR "CENTER GATE D" DETAIL ON PAGE 16 OR 30, RESPECTIVELY, FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.



INDICATES A TYPICAL CAR WIDTH CENTER GATE, WITH HORIZONTAL PIECES OMITTED (1 REQD). SEE THE "CENTER GATE B" OR "CENTER GATE E" DETAIL ON PAGE 17 OR 31, RESPECTIVELY, FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.



PLYWOOD, 1/2" THICK BY LENGTH TO SUIT BY LOAD HEIGHT (1 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".

GATE HOLD DOWN PIECES MUST BE SECURED TO PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE "A"

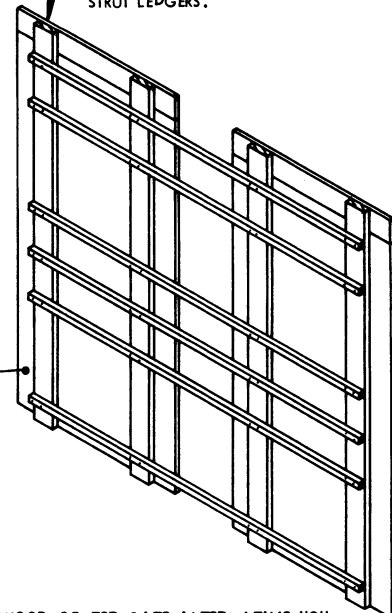
PLYWOOD, 1/2" THICK BY THE UNIT LENGTH BY LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".

PLYWOOD, 1/2" THICK BY LENGTH TO SUIT BY UNIT HEIGHT (1 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".

GATE HOLD DOWN PIECES MUST BE SECURED TO PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE "B"

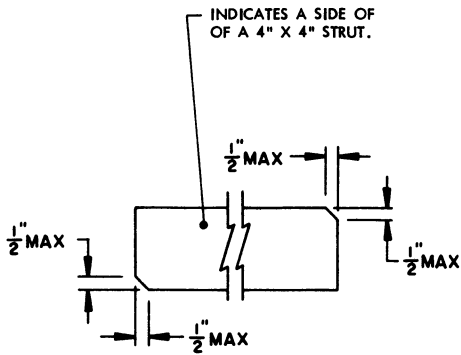
INDICATES A TYPICAL CENTER GATE, WITH THE HORIZONTAL PIECES OMITTED (1 REQD). SEE THE "CENTER GATE C" OR "CENTER GATE F" DETAIL ON PAGE 18 OR 32, RESPECTIVELY, FOR LOCATION OF THE VERTICAL PIECES AND THE STRUT LEDGERS.



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

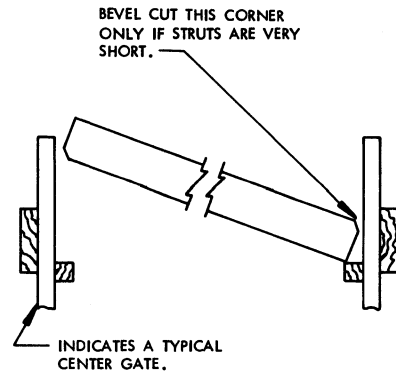
GATE HOLD DOWN PIECES MUST BE SECURED TO PLYWOOD.

PLYWOOD CENTER GATE ALTERNATIVE "C"



BEVEL CUT

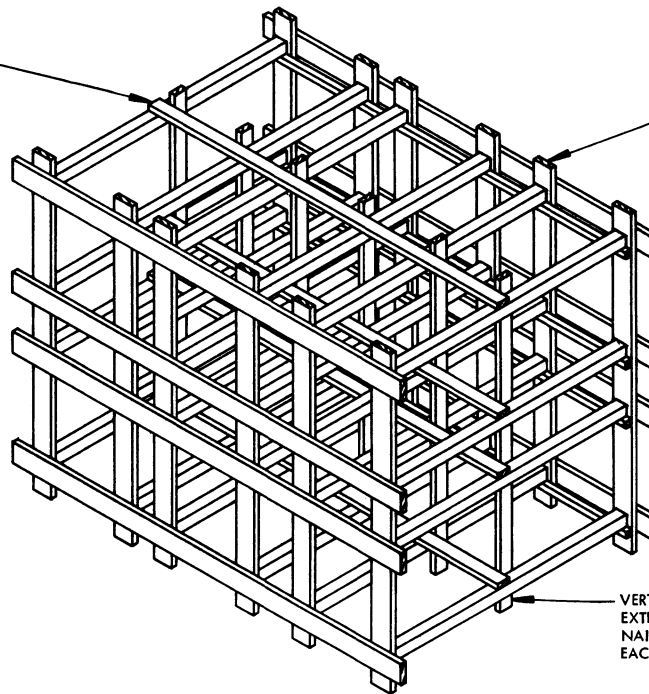
BEVEL CUTTING THE STRUTS AS SPECIFIED WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE FIT." CAUTION: DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2").



STRUT INSTALLATION

SEE GENERAL NOTE "V" 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.

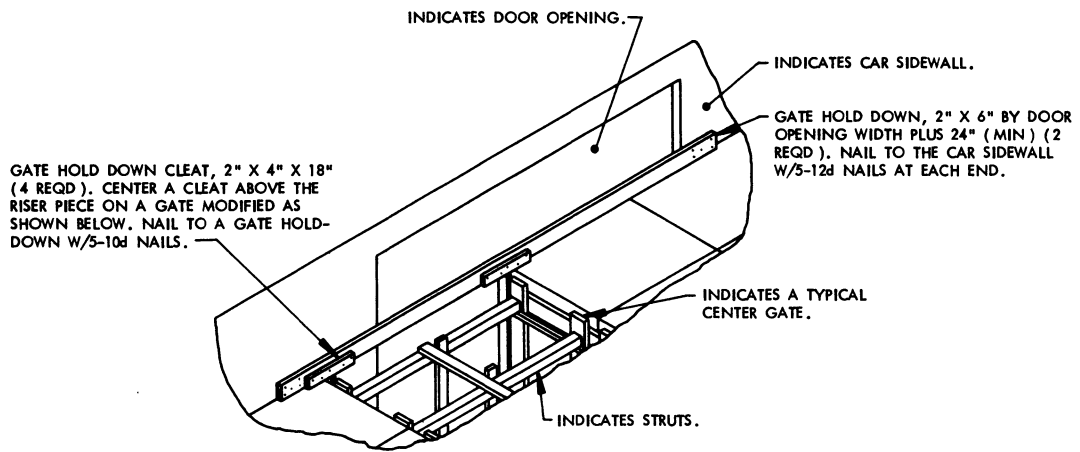


A CENTER GATE FOR A 2-LAYER LOAD OF CONTAINERS-CROSSWISE PALLETS IS SHOWN AS TYPICAL.

VERTICAL STRUT BRACING, 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.

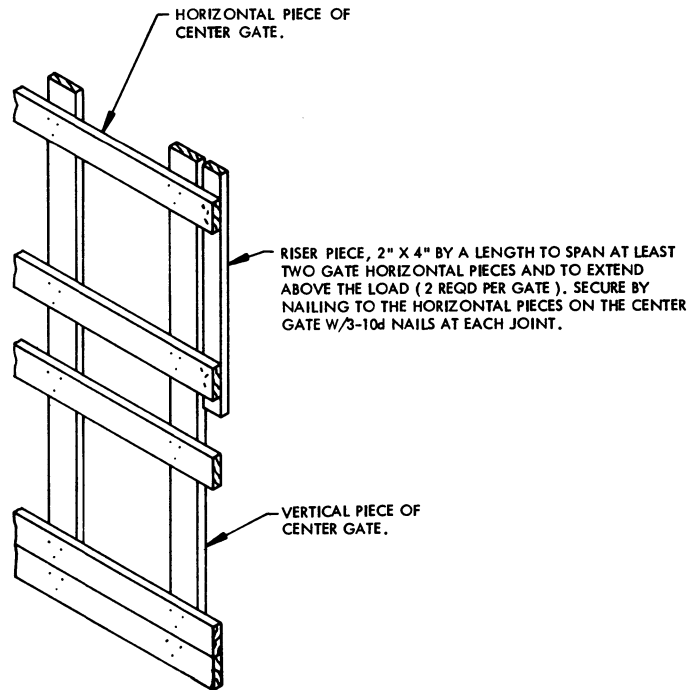
TYPICAL STRUT BRACING

SEE GENERAL NOTE "U" ON PAGE 2.



ALTERNATIVE GATE HOLD-DOWN

THIS VIEW DEPICTS AN ALTERNATIVE METHOD OF CENTER GATE HOLD-DOWN WHICH CAN BE USED IF DEISRED, PROVIDING THE CAR HAS NAILABLE SIDE-WALLS. 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.

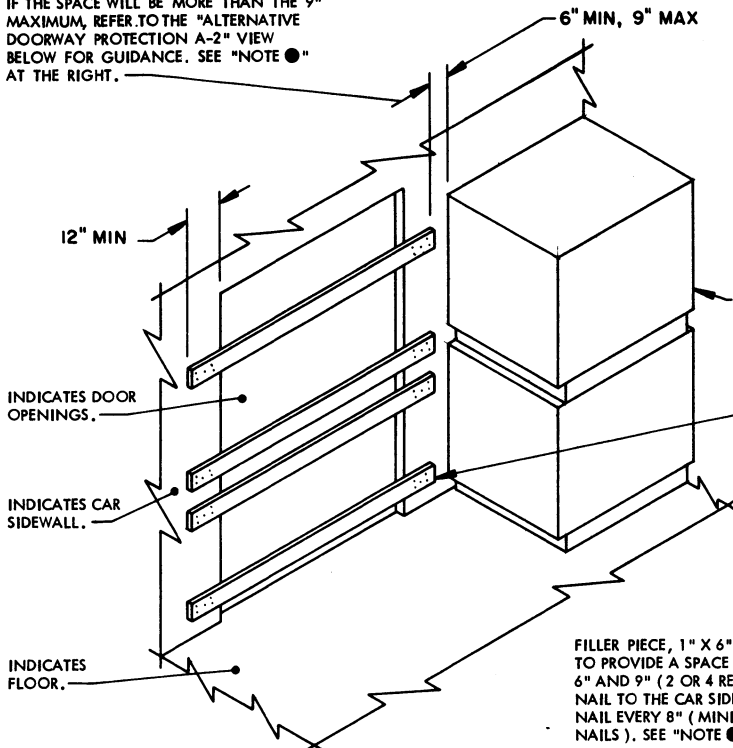


CENTER GATE MODIFICATION

THE MODIFICATION PROCEDURES SHOWN IN THIS VIEW ARE APPLICABLE FOR ALL THE CENTER GATES HEREIN FOR CONTAINERS-LENGTHWISE LOADS, AND FOR CENTER GATES FOR CONTAINERS-CROSSWISE LOADS IN 9'-2" WIDE CARS OR NARROWER. 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. AN EXCESS LATERAL SPACE OF 6" OR LESS MAY BE FILLED BY NAILING LUMBER TO THE CAR SIDEWALL. THE DOOR SPANNERS MUST BE POSITIONED TO BUTT AGAINST THE FILL MATERIAL AND THE TOLERANCE DIMENSION WILL NOT APPLY. ALSO, THE FILLER PIECES SHOWN IN THE ALTERNATIVE DOORWAY PROTECTION A-2 VIEW WILL NOT BE USED. NOTE THAT THE THICKNESS OF THE DOOR SPANNER PIECES MUST EQUAL THE THICKNESS OF THE LUMBER FILL MATERIAL THAT IS NAILED TO THE CAR SIDEWALL.

INDICATES A TYPICAL PALLET UNIT.

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

SEE "NOTE ●" ABOVE.

FILLER PIECE, 1" X 6" BY A LENGTH TO PROVIDE A SPACE OF BETWEEN 6" AND 9" (2 OR 4 REQD PER LAYER). NAIL TO THE CAR SIDEWALL W/7-6d NAIL EVERY 8" (MINIMUM OF 2 NAILS). SEE "NOTE ●" ABOVE.

ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE "ALTERNATIVE DOORWAY PROTECTION G" PROCEDURES ON PAGE 71.

12" MIN

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.

INDICATES OUTSIDE WALL OF CAR.

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

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

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 A TYPICAL PALLET UNIT.

ALTERNATIVE DOORWAY PROTECTION A-3

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

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

VIEW B

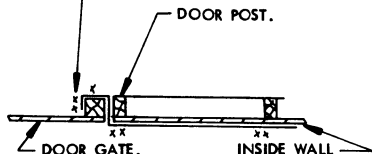
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD).

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

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.

INDICATES FLOOR.

ALTERNATIVE DOORWAY PROTECTION B

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

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.

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.

VIEW A

INDICATES STRAP ANCHOR PLATE.

DOOR SPANNER END OF STRAP.

ISOMETRIC VIEW

VIEW A

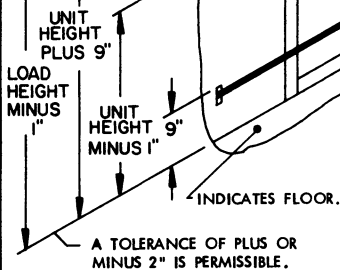
INDICATES STRAP ANCHOR PLATE (2 REQD PER STRAP).

APPLICATION OF STRAPPING TO STRAP ANCHOR PLATE

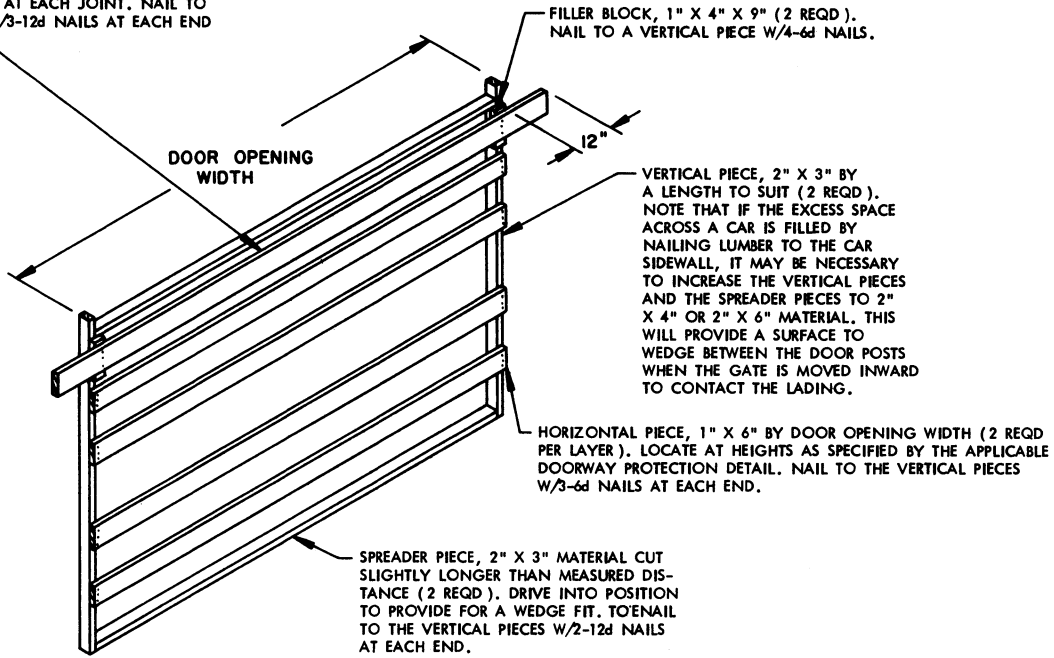
THESE VIEWS DEPICT THE PROPER THREADING OF A DOORWAY PROTECTION STRAP THRU AN ANCHOR PLATE.

ALTERNATIVE DOORWAY PROTECTION C

THIS METHOD OF DOORWAY PROTECTION IS ONLY FOR USE WITH THOSE LOADS IN WHICH THE PALLET UNITS ARE POSITIONED WITH THE CONTAINERS 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.



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.

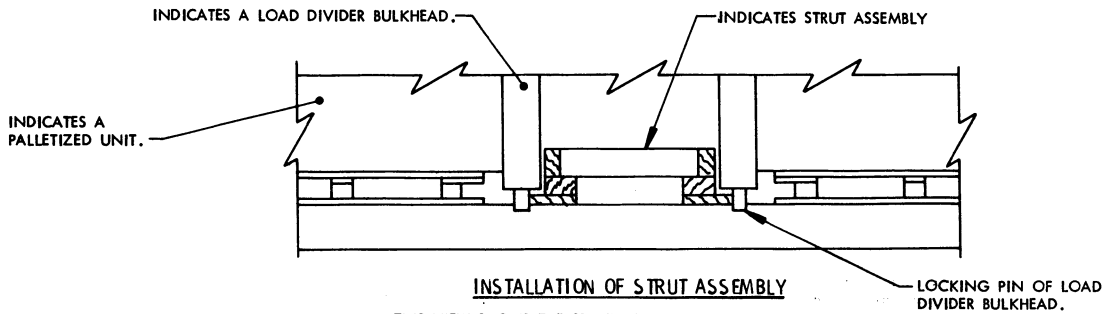
VERTICAL PIECE, 2" X 3" BY A LENGTH TO SUIT (2 REQD). NOTE THAT IF THE EXCESS SPACE ACROSS A CAR IS FILLED BY NAILING LUMBER TO THE CAR SIDEWALL, IT MAY BE NECESSARY TO INCREASE THE VERTICAL PIECES AND THE SPREADER PIECES TO 2" X 4" OR 2" X 6" MATERIAL. THIS WILL PROVIDE A SURFACE TO WEDGE BETWEEN THE 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. TO NAIL TO THE VERTICAL PIECES W/2-12d NAILS AT EACH END.

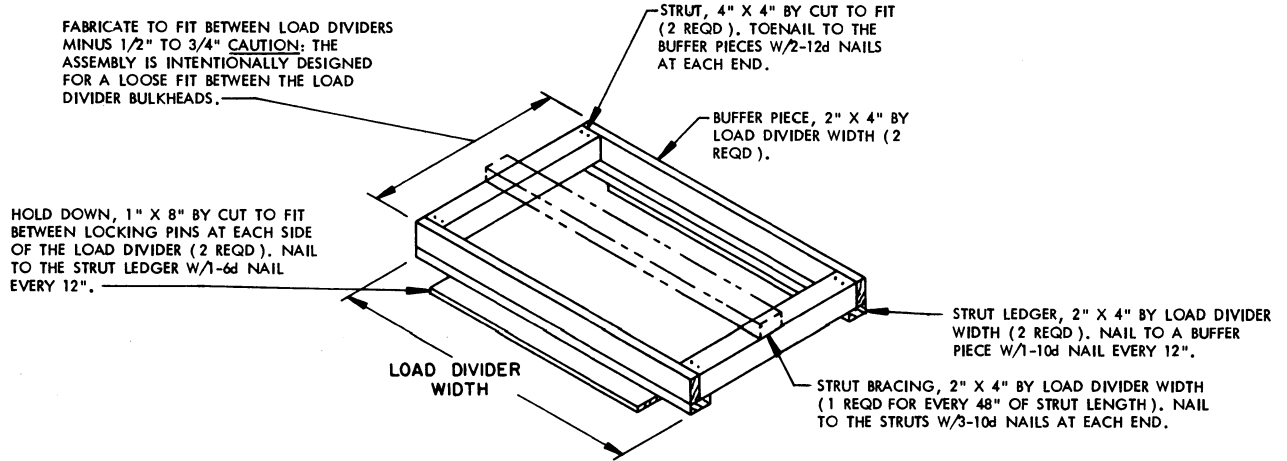
ALTERNATIVE DOORWAY PROTECTION D

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 71 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 69.



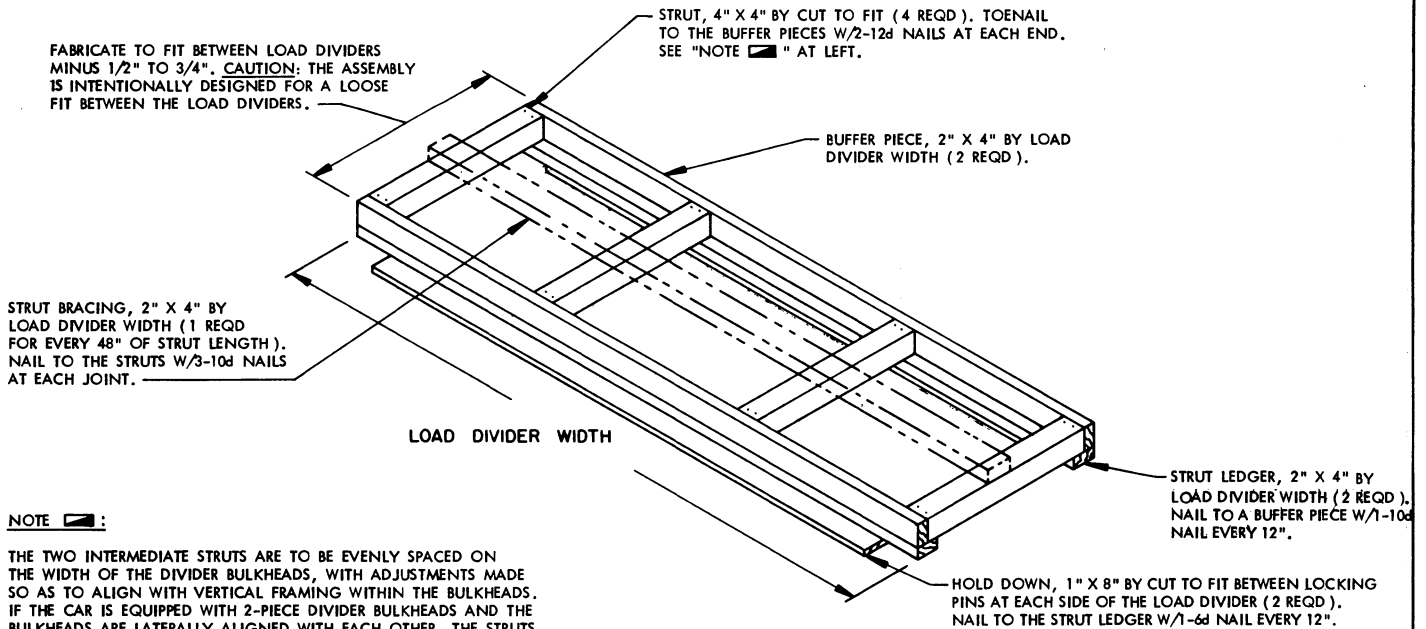
INSTALLATION OF STRUT ASSEMBLY

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



STRUT ASSEMBLY FOR 2-PIECE BULKHEADS

A STRUT ASSEMBLY IS REQUIRED WHEN THE LOAD BEHIND EITHER LOAD DIVIDER BULKHEAD EXCEEDS 50,000 POUNDS OF HAZARD CLASS AND DIVISION 1.1, 1.2 OR 1.3 EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF HAZARD CLASS AND DIVISION 1.4 EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD. **NOTE:** TWO (2) ASSEMBLIES AS SHOWN ARE REQUIRED FOR A 2-PIECE BULKHEAD IF NOT LATERALLY ALIGNED. SEE "NOTE []" BELOW.

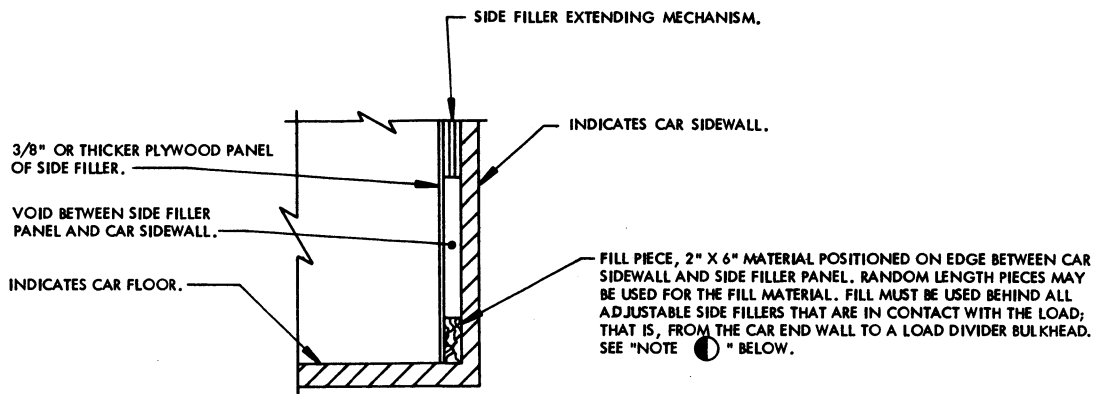


NOTE []:

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

STRUT ASSEMBLY FOR 1-PIECE BULKHEADS

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

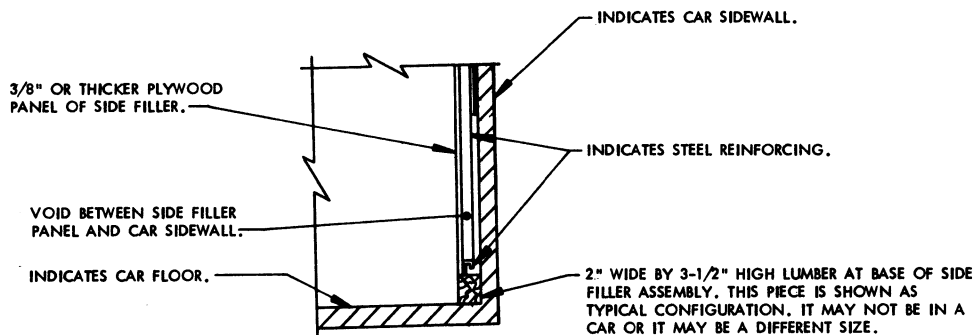


TYPICAL TYPE A

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.