

APPROVED BY  
 BUREAU OF EXPLOSIVES  
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 SUPERVISOR, MILITARY & INTERMODAL SERVICES  
 DATE *5/21/80*

# STINGER

## LOADING AND BRACING (CL & LCL) IN BOX CARS<sup>⊕</sup> OF THE LAUNCH SIMULATOR, PRACTICE, XM32 (PALLETIZED)

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⊕ THIS OUTLOADING PROCEDURE DRAWING INCLUDES PROCEDURES FOR CONVENTIONAL TYPE BOX CARS AND CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.

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				CLASS	DIVISION
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				5515	GM 5SR2

**DO NOT SCALE**

## 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 TO THE STINGER LAUNCH SIMULATOR, PRACTICE, XM32, PACKED TWO (2) PER SHIPPING CONTAINER. SUBSEQUENT REFERENCE TO CONTAINER MEANS SHIPPING CONTAINER WITH CONTENTS. ALSO SUBSEQUENT REFERENCE TO PALLETIZED UNIT MEANS THE PALLETIZED UNIT OF TWELVE (12) SHIPPING CONTAINERS WITH CONTENTS.
- C. FOR DETAILS OF THE STINGER LAUNCH SIMULATOR SHIPPING CONTAINER, SEE US ARMY MISSILE COMMAND DRAWING NO. 13049401.

SHIPPING CONTAINER DIMENSIONS --- 54-7/8" LONG BY 9-3/8" DIAMETER.  
GROSS WEIGHT ----- 61.6 POUNDS (APPROX)

- D. FOR DETAILS OF THE PALLETIZED SHIPPING CONTAINERS, SEE US ARMY DARCOM DRAWING NO. 19-48-5244-GM20SR3 AND "PALLETIZED UNIT" DETAIL ON PAGE 5 OF THIS DRAWING.
- E. THIS ITEM IS A DOT CLASS "B" EXPLOSIVE. THE OUTLOADING PROCEDURES SPECIFIED HEREIN CAN ALSO BE UTILIZED FOR THE SHIPMENT OF THE DEPICTED CONTAINERS WHEN THEY ARE LOADED WITH AN ITEM WHICH IS IDENTIFIED DIFFERENTLY BY NOMENCLATURE THAN THE ITEM DESIGNATED WITHIN THE DRAWING TITLE.
- F. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE. FOR SHIPMENTS IN CONVENTIONAL TYPE BOX CARS, AND FOR SHIPMENTS IN CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS. REFER TO GENERAL NOTES "Y" THROUGH "BB" FOR SPECIFIC GUIDANCE RELATIVE TO OUTLOADING IN CARS HAVING LOAD DIVIDER BULKHEADS.
- G. DUNNAGE LUMBER SPECIFIED THROUGHOUT THIS PROCEDURAL DRAWING IS OF NOMINAL SIZE. FOR EXAMPLE, 1" X 6" MATERIAL IS ACTUALLY 3/4" THICK BY 5-1/2" WIDE AND 2" X 4" MATERIAL IS ACTUALLY 1-1/2" THICK BY 3-1/2" 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. DOUBLE 2" X 6" STRUTS WILL BE LAMINATED W/1-10d NAIL EVERY 6".
- H. NOTICE: A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH DNTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- J. PORTIONS OF THE BOX CARS DEPICTED WITHIN THIS PROCEDURAL DRAWING, SUCH AS SIDEWALLS, END WALLS, AND ROOFS, AND PORTIONS OF THE BLOCKING AND BRACING COMPONENTS, HAVE NOT BEEN SHOWN IN THE LOAD VIEWS FOR CLARITY PURPOSES.
- K. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF TWO (2) SEALS, BUTTED TOGETHER, WITH TWO (2) PAIR OF CRIMPS PER SEAL MUST BE USED TO SEAL THE JOINT.
- L. PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL QUANTITY OF CONTAINERS CAN BE TRANSPORTED. A PARTIAL UNIT MAY BE POSITIONED ON TOP OF THE LOAD, BOX CAR HEIGHT PERMITTING, AND SECURED TO THE UNIT DIRECTLY BELOW WITH STEEL STRAPPING. REFER TO THE "SHIPMENT OF PARTIAL PALLETIZED UNITS" ON PAGE 23 FOR GUIDANCE. FOR THE TRANSPORTATION OF A QUANTITY OF CONTAINERS INSUFFICIENT TO FORM A PARTIAL UNIT (A PARTIAL UNIT WILL CONSIST OF FULL LAYERS) REFER TO THE "SHIPMENT OF LEFTOVER SHIPPING CONTAINERS" PROCEDURES ON PAGE 24 FOR GUIDANCE.
- M. IN SOME INSTANCES CONTAINERS WILL ALREADY BE UNITIZED WHEN OFFERED FOR LOADING. THESE UNITS SHOULD BE INSPECTED AND, AS REQUIRED, LOOSE UNITIZING STEEL STRAPPING MUST BE REPLACED OR TIGHTENED.

(CONTINUED AT RIGHT)

## MATERIAL SPECIFICATIONS

- LUMBER ----- : SEE TM 743-200-1, DUNNAGE LUMBER; FED SPEC MM-L-751.
- NAILS ----- : FED SPEC FF-N-105, COMMON.
- STRAPPING, STEEL -- : CLASS 1, TYPE I OR II, HEAVY DUTY, FINISH A, B (GRADE 2), OR C; FED SPEC QQ-5-781.
- SEAL, STRAP ----- : TYPE D, STYLE I, II, OR IV, CLASS H, FED SPEC QQ-5-781.
- STAPLE, STRAP ----- : TYPE III, STYLE 3, 1-17/32" WIDE BY 3/4" LEG LENGTH, OR EQUIVALENT. FED SPEC FF-N-105.
- WIRE ----- : FED SPEC QQ-W-461.

## (GENERAL NOTES CONTINUED)

- N. WHEN REFERRING TO THE PALLET UNIT LENGTH OR UNIT WIDTH, THE 40" DIMENSION OF THE PALLET BASE CONSTITUTES THE LENGTH AND THE 48" DIMENSION CONSTITUTES THE WIDTH. SEE THE PALLETIZED UNIT ON PAGE 5.
- O. 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.
- P. THE SELECTION OF RAIL CARS FOR THE TRANSPORT OF THE DESIGNATED ITEMS 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 DOCUMENT, WILL BE SELECTED. WHEN SELECTING RAIL CARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOX CARS THAT DO NOT HAVE BOWED END WALLS. CARS WITH 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 31 FOR GUIDANCE.
- Q. NOTICE: WHEN POSITIONING UNITS IN A CAR THEY SHOULD BE PLACED TIGHTLY AGAINST A CAR SIDEWALL AND/OR AGAINST A LATERALLY ADJACENT UNIT, AS APPLICABLE, 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 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 UNITS, SUCH AS THE JOINTS BETWEEN THE LAYERS 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.
- R. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOX CAR BEING LOADED OR THE QUANTITY TO BE SHIPPED; HOWEVER, THE APPROVED METHODS SPECIFIED HEREIN MUST BE FOLLOWED AS CLOSELY AS POSSIBLE FOR BLOCKING, BRACING, AND STAYING OF THE UNITS. NOTICE: A SHIPMENT WILL BE POSITIONED IN THE RAIL CAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.
- S. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH THE DESIGNATED ITEMS, 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.
- T. IF THE CAR BEING USED FOR A SHIPMENT IS EQUIPPED WITH A NAILABLE METAL FLOOR AND A NAIL SIZE FOR FLOOR NAILING IS MARKED ON THE SIDEWALL OF THE CAR, THAT GUIDANCE SHOULD BE APPLIED TO THE NAILING OF THE "DOORWAY BLOCKING" PIECES IN THE FULL LOADS AND TO THE NAILING TO THE CAR FLOOR OF THE LCL BRACES AND KNEE BRACE ASSEMBLIES IN THE LESS-THAN-FULL LOADS. IF A NAIL SIZE IS NOT SPECIFIED IN THE CAR, 30d NAILS SHOULD BE USED IN LIEU OF THOSE SPECIFIED IN THE APPLICABLE KEY NUMBERS. SEE GENERAL NOTE "H" ON THIS PAGE.
- U. 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 OR THREE MORE LOAD UNITS IN ONE END THAN IN THE OTHER IS CONSIDERED TO BE AN OFFSET LOAD.
- V. LOAD-BLOCKING STRUTS WHICH ARE 48" OR LONGER MUST BE STIFFENED BY THE APPLICATION OF HORIZONTAL AND VERTICAL STRUT BRACING AS SHOWN BY KEY NUMBERS ⑨ AND ⑩ ON PAGE 21. THESE PIECES ARE NOT REQUIRED IF THE STRUTS FOR THE LOAD BEING SHIPPED ARE SHORTER THAN 48". THE LENGTH OF THE LOAD-BLOCKING STRUTS SHOULD BE KEPT AS SHORT AS POSSIBLE (APPROX 18" MINIMUM), BUT IN THE EVENT IT IS NECESSARY TO USE STRUTS WHICH ARE 8'-0" OR MORE IN LENGTH, IT WILL BE NECESSARY TO APPLY AN ADDITIONAL SET OF HORIZONTAL AND VERTICAL STRUT BRACING PIECES. STRUT BRACING SHOULD BE APPLIED SO AS TO PROVIDE NEARLY EQUAL SPACES BETWEEN THE BRACING PIECES AND THE CENTER GATES AND/OR BETWEEN ADJACENT STRUT BRACING PIECES. NOTE THAT HORIZONTAL STRUT BRACING PIECES FOR THE UPPER LEVEL OF STRUTS FOR ALL BUT THE UPPERMOST TIER OF A LOAD MAY BE DIFFICULT TO APPLY TO THE TOP SURFACES OF THE STRUTS AS DEPICTED. STRUT BRACING WILL BE EQUALLY EFFECTIVE IF APPLIED TO THE UNDER SIDE OF THOSE STRUTS.

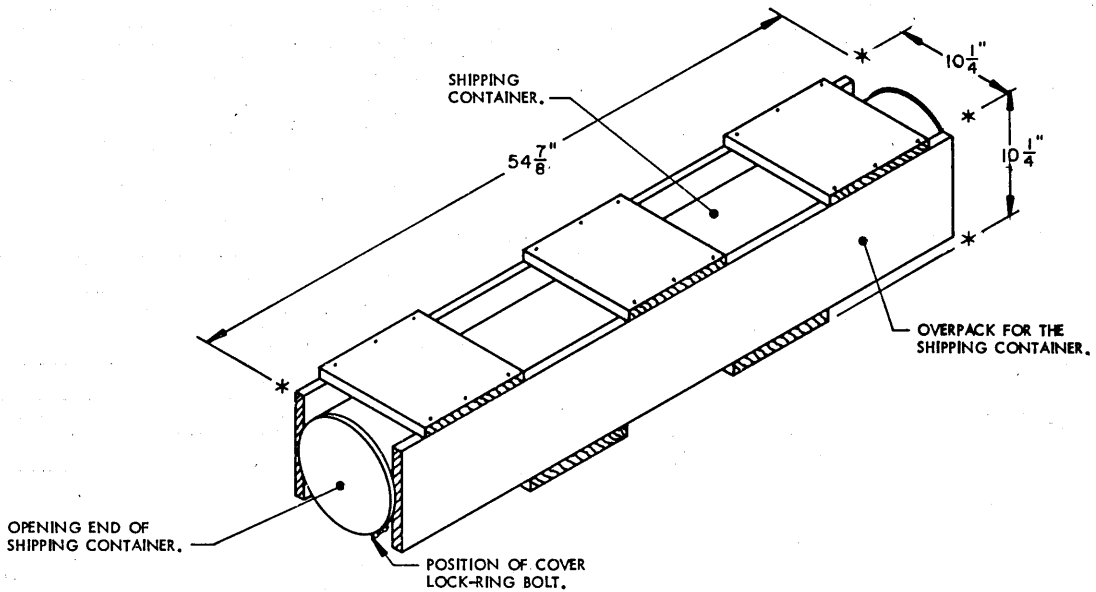
(CONTINUED ON PAGE 3)

( GENERAL NOTES CONTINUED )

- W. TO ACHIEVE A TIGHTLY BLOCKED LOAD, A STRUT WILL BE CUT SLIGHTLY LONGER THAN THE MEASURED DISTANCE BETWEEN THE STRUT BEARING AREAS ON THE TWO CENTER GATES. ONE END OF THE STRUT WILL BE POSITIONED AT ITS BEARING AREA JUST ABOVE THE STRUT LEDGER ON ONE GATE, THEN THE OTHER END, WHICH CAN BE BEVELED ON THE LOWER CORNER IF DESIRED, WILL 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 30 FOR BEVELING INSTRUCTIONS AND THE "STRUT INSTALLATION" DETAIL ON THAT PAGE FOR A PICTORIAL VIEW SHOWING THE PROPER POSITIONING OF A BEVELED STRUT FOR INSTALLATION. NOTE THAT THE UPPER CORNER NEEDS TO BE BEVELED ONLY IF THE STRUTS ARE VERY SHORT. IF ONLY ONE END IS BEVEL-CUT, THE BEVELED EDGE WILL BE PLACED IN THE DOWNWARD POSITION SO THAT IT WILL ALLOW THE STRUT END TO SLIDE MORE FREELY DOWN THE FACE OF THE VERTICAL PIECE ON THE ADJACENT CENTER GATE AS THE STRUT IS DRIVEN DOWN INTO ITS FINAL BLOCKING POSITION.
- X. 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 HEREIN. A LOAD PLAN SHOULD BE DEVELOPED WHICH WILL BE THE MOST EFFICIENT AS TO THE AMOUNT OF DUNNAGE REQUIRED AND THE EASE OF LOADING FOR THE QUANTITY TO BE SHIPPED.
- Y. THE OUTLOADING PROCEDURES SPECIFIED ON PAGES 10 AND 11 ARE FOR CUSHIONED BOX CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH OR WITHOUT ADJUSTABLE SIDE FILLERS. CAUTION: 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. ALSO, 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. CAUTION: THE WEIGHT OF THE LOAD TO BE RETAINED BY ONE LOAD DIVIDER BULKHEAD MUST NOT EXCEED ONE-HALF OF THE LOAD LIMIT WHICH IS STENCILED ON THE SIDE OF THE CAR. 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.
- Z. 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 AMMUNITION ITEMS.
- AA. 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 32 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 32, THE "FILL PIECE" MATERIAL IS NOT REQUIRED. NOTE: DUNNAGE MATERIALS MUST NOT BE NAILED TO SIDE FILLERS.
- BB. 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.
- CC. NOTICE: FOR MAXIMUM LOADS WITHIN THIS DRAWING, 50'-6" LONG BOX CARS ARE SHOWN. HOWEVER, THE BLOCKING AND BRACING PROCEDURES USED ARE ALSO ADEQUATE FOR MAXIMUM LOADS IN BOX CARS WHICH ARE 60'-8" LONG, OR OF OTHER LENGTHS.
- DD. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

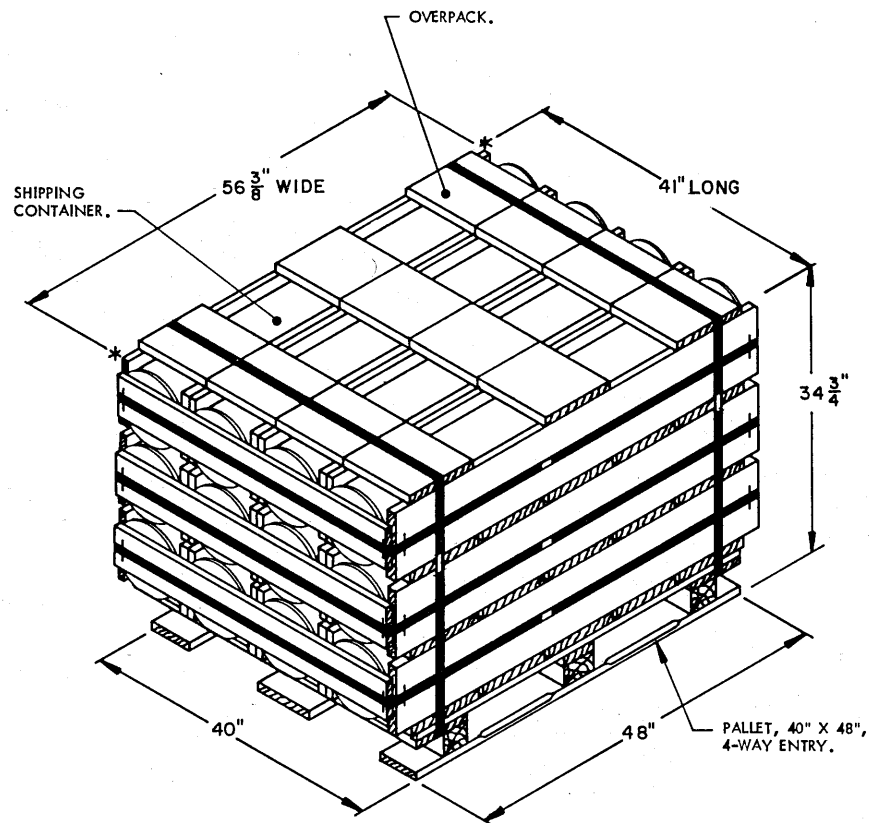
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**SHIPPING CONTAINER IN OVERPACK**

NOTE: EACH SHIPPING CONTAINER CONTAINS TWO (2) LAUNCH SIMULATORS.

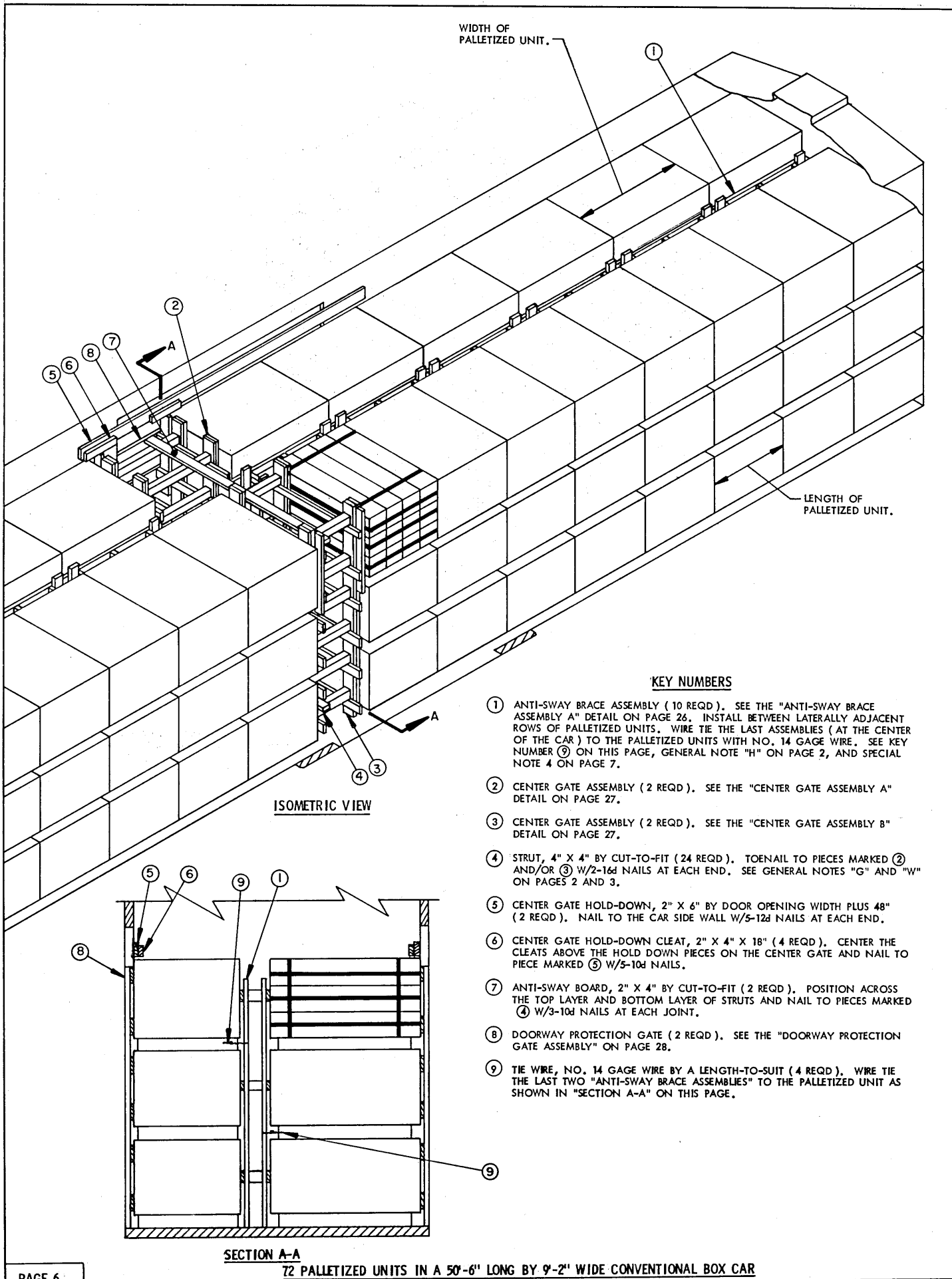


**PALLETIZED UNIT**

**NOTE:** EACH PALLETIZED UNIT CONTAINS TWENTY FOUR (24) LAUNCH SIMULATORS. (TWELVE SHIPPING CONTAINERS IN OVERPACK).

**UNIT DATA:**

GROSS WEIGHT ----- 1,131 POUNDS (APPROX).  
 CUBE ----- 46.5 CUBIC FEET.



WIDTH OF PALLETTIZED UNIT.

LENGTH OF PALLETTIZED UNIT.

ISOMETRIC VIEW

SECTION A-A

72 PALLETTIZED UNITS IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

**KEY NUMBERS**

- ① ANTI-SWAY BRACE ASSEMBLY ( 10 REQD ). SEE THE "ANTI-SWAY BRACE ASSEMBLY A" DETAIL ON PAGE 26. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETTIZED UNITS. WIRE TIE THE LAST ASSEMBLIES ( AT THE CENTER OF THE CAR ) TO THE PALLETTIZED UNITS WITH NO. 14 GAGE WIRE. SEE KEY NUMBER ⑨ ON THIS PAGE, GENERAL NOTE "H" ON PAGE 2, AND SPECIAL NOTE 4 ON PAGE 7.
- ② CENTER GATE ASSEMBLY ( 2 REQD ). SEE THE "CENTER GATE ASSEMBLY A" DETAIL ON PAGE 27.
- ③ CENTER GATE ASSEMBLY ( 2 REQD ). SEE THE "CENTER GATE ASSEMBLY B" DETAIL ON PAGE 27.
- ④ STRUT, 4" X 4" BY CUT-TO-FIT ( 24 REQD ). TOENAIL TO PIECES MARKED ② AND/OR ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "G" AND "W" ON PAGES 2 AND 3.
- ⑤ CENTER GATE HOLD-DOWN, 2" X 6" BY DOOR OPENING WIDTH PLUS 48" ( 2 REQD ). NAIL TO THE CAR SIDE WALL W/5-12d NAILS AT EACH END.
- ⑥ CENTER GATE HOLD-DOWN CLEAT, 2" X 4" X 18" ( 4 REQD ). CENTER THE CLEATS ABOVE THE HOLD DOWN PIECES ON THE CENTER GATE AND NAIL TO PIECE MARKED ⑤ W/5-10d NAILS.
- ⑦ ANTI-SWAY BOARD, 2" X 4" BY CUT-TO-FIT ( 2 REQD ). POSITION ACROSS THE TOP LAYER AND BOTTOM LAYER OF STRUTS AND NAIL TO PIECES MARKED ④ W/3-10d NAILS AT EACH JOINT.
- ⑧ DOORWAY PROTECTION GATE ( 2 REQD ). SEE THE "DOORWAY PROTECTION GATE ASSEMBLY" ON PAGE 28.
- ⑨ TIE WIRE, NO. 14 GAGE WIRE BY A LENGTH-TO-SUIT ( 4 REQD ). WIRE TIE THE LAST TWO "ANTI-SWAY BRACE ASSEMBLIES" TO THE PALLETTIZED UNIT AS SHOWN IN "SECTION A-A" ON THIS PAGE.

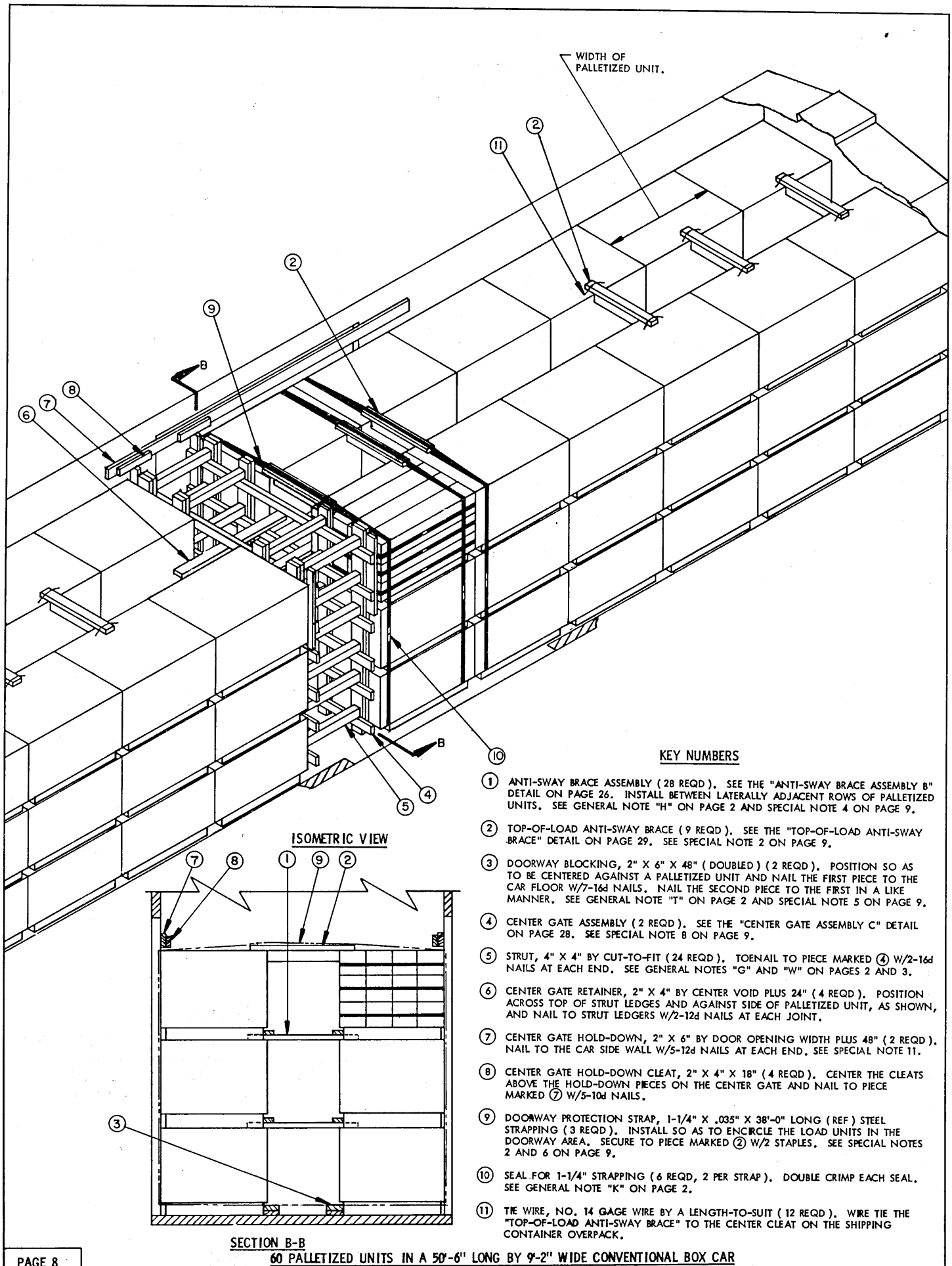
**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE "THRU" DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS OR "STAGGERED" DOOR OPENINGS MAY ALSO BE USED.
2. THE PURPOSE OF THE COMBINATION LOAD SHOWN ON PAGE 6 IS TO ACHIEVE A MAXIMUM QUANTITY LOAD OF PALLETIZED UNITS. FOR SHIPMENT OF A LOAD WHICH CONTAINS LESS PALLETIZED UNITS THAN SHOWN, SEE THE METHODS SHOWN ON PAGES 8, 9, AND 12 THROUGH 21.
3. IF THE CAR BEING LOADED IS EQUIPPED WITH LOAD DIVIDER BULKHEADS, SEE THE PROCEDURES ON PAGES 10 AND 11.
4. A WIDER OR NARROWER CAR CAN BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF THE "ANTI-SWAY BRACE ASSEMBLY A". IF THE TOTAL EXCESS SPACE BETWEEN THE LATERALLY ADJACENT PALLETIZED UNITS IS 5" OR LESS THE "ANTI-SWAY BRACE ASSEMBLY A" MAY BE OMITTED.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLETIZED UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLETIZED UNIT WIDTH, OR ONE-HALF OR MORE OF THE PALLETIZED UNIT LENGTH. SEE SPECIAL NOTE 6 ON THIS PAGE.
6. IF THE CAR BEING LOADED HAS "THRU" PLUG DOORS OR "STAGGERED" PLUG DOORS OF ANY WIDTH, DOORWAY PROTECTION STRAPS, SHOWN AS PIECES MARKED (B) IN THE LOAD ON PAGES 10 AND 11 WILL BE REQUIRED IN LIEU OF THE "DOORWAY PROTECTION GATE" SHOWN AS PIECE MARKED (B) ON PAGE 6. IF THE CAR BEING LOADED HAS STAGGERED CONVENTIONAL SLIDING DOORS (ANY WIDTH) OR "THRU" CONVENTIONAL SLIDING DOORS (ANY WIDTH), DOORWAY PROTECTION GATES, SHOWN AS PIECE MARKED (B) ON PAGE 6, WILL ALWAYS BE REQUIRED TO RETAIN THE PALLETIZED UNITS AND/OR THE CENTER GATE ASSEMBLIES. SEE SPECIAL NOTE 5 ON THIS PAGE AND GENERAL NOTE "O" ON PAGE 2.
7. IF THE BOX CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31 AND GENERAL NOTE "P" ON PAGE 2.
8. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL THREE LAYERS OF SHIPPING CONTAINERS ARE TO BE TRANSPORTED, SEE PAGES 14 AND 23 FOR GUIDANCE.
9. FOR SHIPMENT OF ONE OR MORE LEFTOVER SHIPPING CONTAINERS, SEE PAGES 14 AND 24 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	120	60
2" X 3"	34	17
2" X 4"	831	554
2" X 6"	172	172
4" X 4"	63	84
NAILS	NO. REQD	POUNDS
6d (2")	72	1/2
10d (3")	1012	15-1/2
12d (3-1/4")	20	1/2
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE ----- 12' REQD ----- NIL		

**LOAD AS SHOWN**

ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	72	81,432 LBS
DUNNAGE		1,793 LBS
<b>TOTAL WEIGHT</b>		<b>83,225 LBS</b>



WIDTH OF  
PALLETIZED UNIT.

**KEY NUMBERS**

- ① ANTI-SWAY BRACE ASSEMBLY (28 REQD). SEE THE "ANTI-SWAY BRACE ASSEMBLY B" DETAIL ON PAGE 26. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETIZED UNITS. SEE GENERAL NOTE "H" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (9 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 29. SEE SPECIAL NOTE 2 ON PAGE 9.
- ③ DOORWAY BLOCKING, 2" X 6" X 48" (DOUBLED) (2 REQD). POSITION SO AS TO BE CENTERED AGAINST A PALLETIZED UNIT AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/7-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE GENERAL NOTE "T" ON PAGE 2 AND SPECIAL NOTE 5 ON PAGE 9.
- ④ CENTER GATE ASSEMBLY (2 REQD). SEE THE "CENTER GATE ASSEMBLY C" DETAIL ON PAGE 28. SEE SPECIAL NOTE 8 ON PAGE 9.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (24 REQD). TOENAIL TO PIECE MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "G" AND "W" ON PAGES 2 AND 3.
- ⑥ CENTER GATE RETAINER, 2" X 4" BY CENTER VOID PLUS 24" (4 REQD). POSITION ACROSS TOP OF STRUT LEDGES AND AGAINST SIDE OF PALLETIZED UNIT, AS SHOWN, AND NAIL TO STRUT LEDGERS W/2-12d NAILS AT EACH JOINT.
- ⑦ CENTER GATE HOLD-DOWN, 2" X 6" BY DOOR OPENING WIDTH PLUS 48" (2 REQD). NAIL TO THE CAR SIDE WALL W/5-12d NAILS AT EACH END. SEE SPECIAL NOTE 11.
- ⑧ CENTER GATE HOLD-DOWN CLEAT, 2" X 4" X 18" (4 REQD). CENTER THE CLEATS ABOVE THE HOLD-DOWN PIECES ON THE CENTER GATE AND NAIL TO PIECE MARKED ⑦ W/5-10d NAILS.
- ⑨ DOORWAY PROTECTION STRAP, 1-1/4" X .035" X 38'-0" LONG (REF) STEEL STRAPPING (3 REQD). INSTALL SO AS TO ENCRICLE THE LOAD UNITS IN THE DOORWAY AREA. SECURE TO PIECE MARKED ② W/2 STAPLES. SEE SPECIAL NOTES 2 AND 6 ON PAGE 9.
- ⑩ SEAL FOR 1-1/4" STRAPPING (6 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "K" ON PAGE 2.
- ⑪ TIE WIRE, NO. 14 GAGE WIRE BY A LENGTH-TO-SUIT (12 REQD). WIRE TIE THE "TOP-OF-LOAD ANTI-SWAY BRACE" TO THE CENTER CLEAT ON THE SHIPPING CONTAINER OVERPACK.

**ISOMETRIC VIEW**

**SECTION B-B**

60 PALLETIZED UNITS IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOX CAR

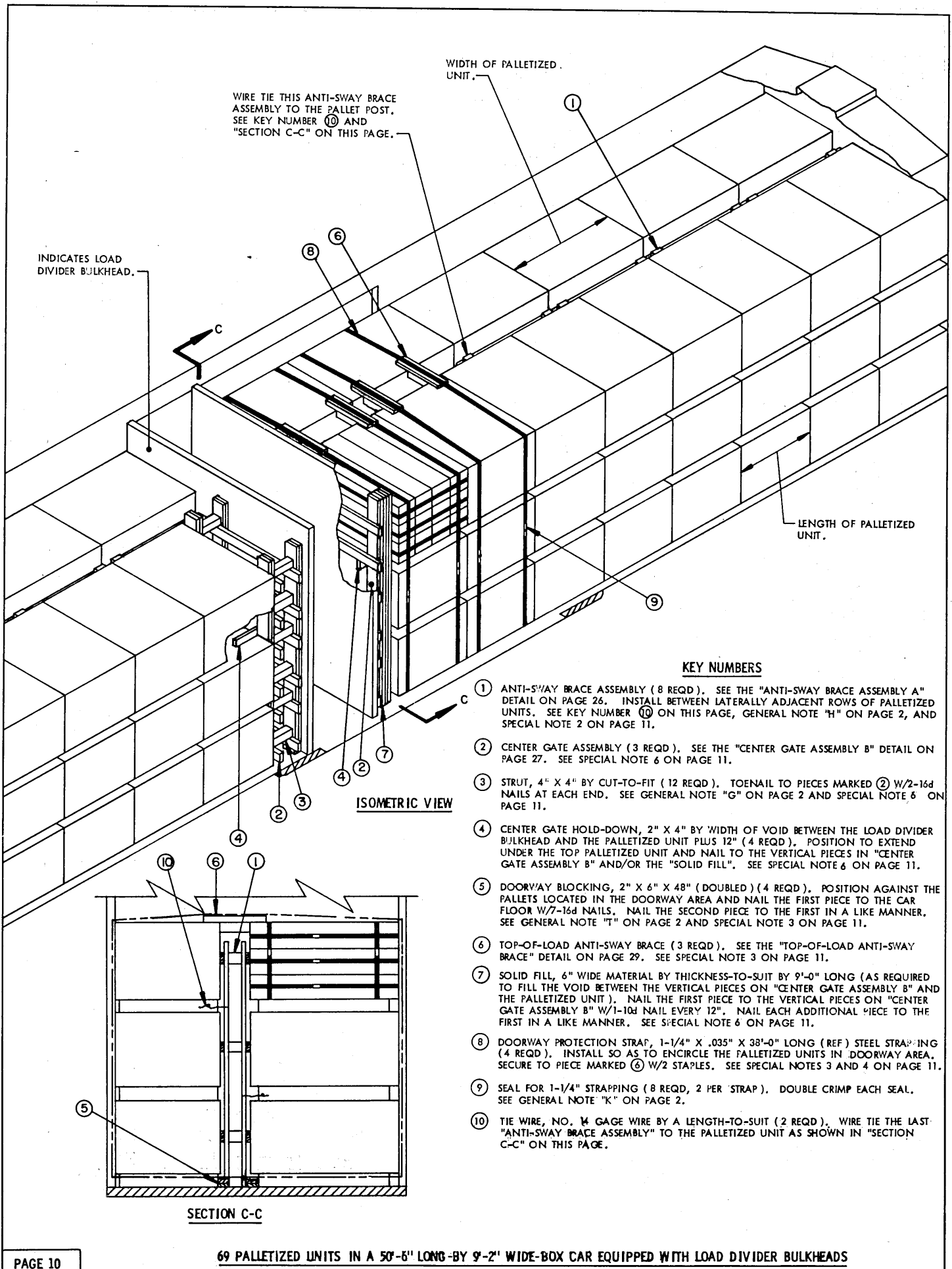


**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE "THRU" DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS OR "STAGGERED" DOOR OPENINGS MAY ALSO BE USED.
2. TOP-OF-LOAD ANTI-SWAY BRACES MUST BE INSTALLED ON THE FIRST THREE (3) STACKS AT EACH END OF THE BOX CAR, AS SHOWN ON PAGE 8. WIRE TIE TO THE PALLETIZED UNIT WITH NO. 14 GAGE WIRE. USE THREE (3) TOP-OF-LOAD ANTI-SWAY BRACES FOR STRAPPING BOARDS ON TOP OF THE STACKS WITHIN THE DOORWAY AREA OF THE CAR, AS SHOWN ON PAGE 8.
3. IF THE CAR BEING LOADED IS EQUIPPED WITH LOAD DIVIDER BULKHEADS, SEE THE PROCEDURES ON PAGES 10 AND 11.
4. A WIDER OR NARROWER CAR CAN BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF THE "ANTI-SWAY BRACE ASSEMBLY B".
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLETIZED UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLETIZED UNIT WIDTH, OR ONE-HALF OR MORE OF THE PALLETIZED UNIT LENGTH. SEE SPECIAL NOTE 6 ON THIS PAGE.
6. IF THE CAR BEING LOADED HAS "THRU" PLUG DOORS OR "STAGGERED" PLUG DOORS OF ANY WIDTH, DOORWAY PROTECTION STRAP, SHOWN AS PIECES MARKED (7) IN THE LOAD ON PAGE 8 WILL BE REQUIRED. IF THE CAR BEING LOADED HAS STAGGERED CONVENTIONAL SLIDING DOORS (ANY WIDTH) OR "THRU" CONVENTIONAL SLIDING DOORS (ANY WIDTH), DOORWAY PROTECTION GATES, SHOWN AS PIECE MARKED (8) ON PAGE 6, OR DOORWAY PROTECTION STRAP, SHOWN AS PIECES MARKED (7) ON PAGE 8, WILL ALWAYS BE REQUIRED. SEE SPECIAL NOTE 5 ON THIS PAGE AND GENERAL NOTE "O" ON PAGE 2.
7. IF THE BOX CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31, AND GENERAL NOTE "P" ON PAGE 2.
8. FOR EASE OF HANDLING, SPLIT CENTER GATES WHICH ARE NOT DEPENDENT UPON THE WIDTH OF THE CAR, MAY BE USED AS AN ALTERNATIVE. IN LIEU OF EACH "CENTER GATE ASSEMBLY C", INSTALL TWO (2) GATES AS SHOWN IN THE "TIE PIECE APPLICATION" DETAIL ON PAGE 31. THE SPLIT GATES MUST BE TIED TOGETHER AS DEPICTED.
9. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL THREE LAYERS OF SHIPPING CONTAINERS ARE TO BE TRANSPORTED, SEE PAGES 14 AND 23 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE OR MORE LEFTOVER SHIPPING CONTAINERS, SEE PAGES 14 AND 24 FOR GUIDANCE.
11. IF DESIRED THE CENTER GATE HOLD-DOWN MAY BE DOOR OPENING WIDTH PLUS 24" IN LENGTH. HOWEVER, AN EXTRA PIECE OF 2" X 6" BY LENGTH-TO-SUIT MUST BE POSITIONED AT ONE END AND NAILED TO THE SIDEWALL OF THE CAR, TO PROVIDE A FILLER FOR THE CENTER GATE HOLD-DOWN CLEAT SHOWN AS PIECES MARKED (8).

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	556	371
2" X 6"	188	188
4" X 4"	74	126
NAILS	NO. REQD	POUNDS
10d (3")	524	8-1/2
12d (3-1/4")	81	1-1/2
16d (3-1/2")	122	2-3/4
STEEL STRAPPING, 1-1/4" X .035"	114' REQD	16 LBS.
SEAL FOR 1-1/4" STRAPPING	6 REQD	NIL
STAPLES FOR 1-1/4" STRAPPING	6 REQD	NIL
WIRE, NO. 14 GAGE	36' REQD	NIL

LOAD AS SHOWN		
ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT	60	47,840 LBS
DUNNAGE		1,399 LBS
<b>TOTAL WEIGHT</b>		<b>49,239 LBS</b>



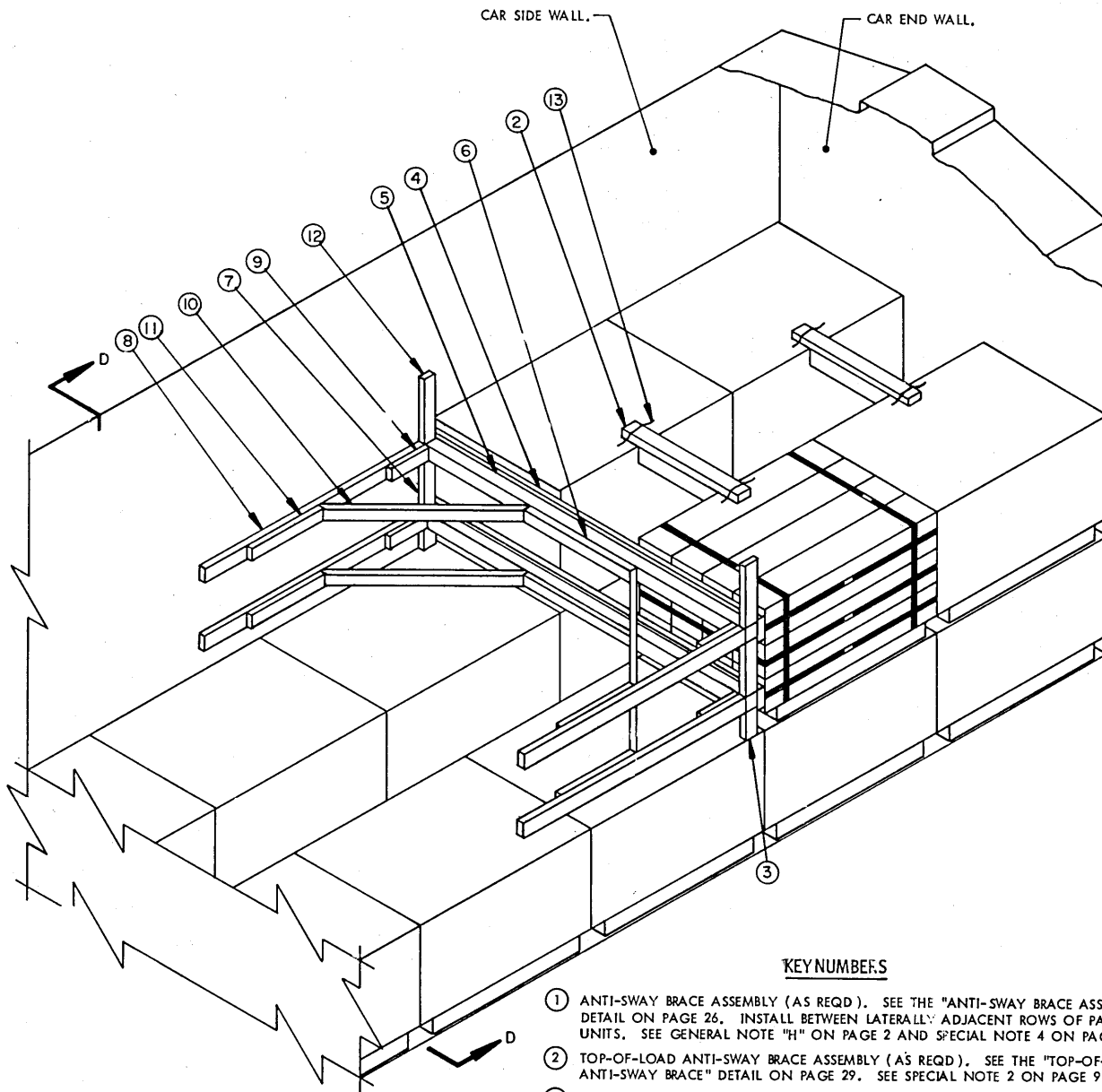
**SPECIAL NOTES:**

1. A 50'-6" LONG BY 9'-2" WIDE CUSHIONED BOX CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 12'-0" WIDE "THRU" DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS OR "STAGGERED" DOOR OPENINGS, MAY ALSO BE USED.
2. A WIDER OR NARROWER CAR CAN BE USED FOR SHIPPING THE DEPICTED LOAD BY ADJUSTING THE WIDTH OF THE "ANTI-SWAY BRACE ASSEMBLY A". IF THE TOTAL EXCESS SPACE BETWEEN THE LATERALLY ADJACENT PALLETIZED UNITS IS 5" OR LESS THE "ANTI-SWAY BRACE ASSEMBLY A" MAY BE OMITTED.
3. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLETIZED UNITS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE PALLETIZED UNIT WIDTH, OR ONE-HALF OR MORE OF THE PALLETIZED UNIT LENGTH. SEE SPECIAL NOTE 4 ON THIS PAGE.
4. IF THE CAR BEING LOADED HAS "THRU" PLUG DOORS OR "STAGGERED" PLUG DOORS OF ANY WIDTH, DOORWAY PROTECTION STRAPS, SHOWN AS PIECES MARKED (C) IN THE LOAD ON PAGE 10 WILL BE REQUIRED. IF THE CAR BEING LOADED HAS STAGGERED CONVENTIONAL SLIDING DOORS (ANY WIDTH) OR "THRU" CONVENTIONAL SLIDING DOORS (ANY WIDTH), DOORWAY PROTECTION GATES, SHOWN AS PIECE MARKED (B) ON PAGE 6, OR DOORWAY PROTECTION STRAP, SHOWN AS PIECES MARKED (B) ON PAGE 10, WILL ALWAYS BE REQUIRED. SEE SPECIAL NOTE 3 ON THIS PAGE AND GENERAL NOTE "O" ON PAGE 2.
5. IF THE BOX CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31 AND GENERAL NOTE "P" ON PAGE 2.
6. PIECES MARKED (2), (3), (4), AND (7) MUST BE ASSEMBLED IN PLACE PRIOR TO POSITIONING THE LOAD DIVIDER BULKHEADS. NOTE THAT THE "CENTER GATE ASSEMBLY B", USED AT THE HEAVY END OF THE CAR, IS POSITIONED WITH THE STRUT LEDGERS AGAINST THE LOAD DIVIDER BULKHEAD.
7. IF PALLETIZED UNITS WHICH DO NOT CONTAIN A FULL THREE LAYERS OF SHIPPING CONTAINERS ARE TO BE TRANSPORTED, SEE PAGES 14 AND 23 FOR GUIDANCE.
8. FOR SHIPMENT OF ONE OR MORE LEFTOVER SHIPPING CONTAINERS, SEE PAGES 14 AND 24 FOR GUIDANCE.
9. FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS, SEE GENERAL NOTES "Y", "Z", "AA", AND "BB" ON PAGE 3.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	674	450
2" X 6"	194	194
4" X 4"	24	32
NAILS	NO. REQD	POUNDS
10d (3")	222	12-3/4
12d (3-1/4")	36	3/4
16d (3-1/2")	104	2-1/4
STEEL STRAPPING, 1-1/4" X .035" -----	152' REQD -----	22 LBS
SEAL FOR 1-1/4" STRAPPING -----	8 REQD -----	NIL
STAPLES FOR 1-1/4" STRAPPING -----	9 REQD -----	NIL
WIRE, NO. 14 GAGE -----	6' REQD -----	NIL

**LOAD AS SHOWN**

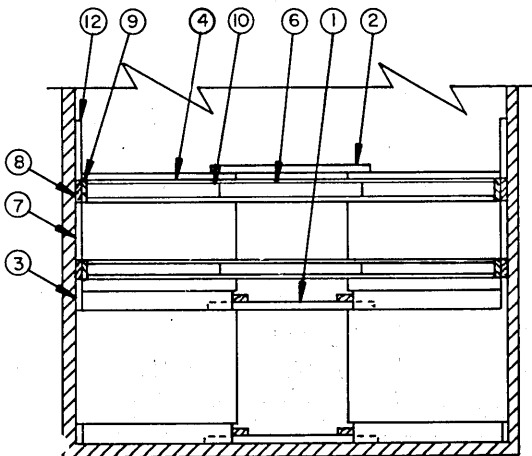
ITEM	QUANTITY	WEIGHT (APPROX)
PALLETIZED UNIT -----	69 -----	78,039 LBS
DUNNAGE -----		1,390 LBS
<b>TOTAL WEIGHT -----</b>		<b>79,429 LBS</b>



ISOMETRIC VIEW

KEY NUMBERS

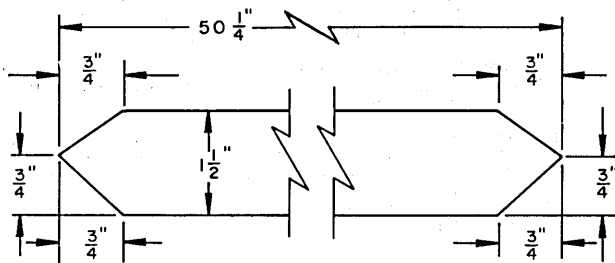
- ① ANTI-SWAY BRACE ASSEMBLY (AS REQD). SEE THE "ANTI-SWAY BRACE ASSEMBLY B" DETAIL ON PAGE 26. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETIZED UNITS. SEE GENERAL NOTE "H" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY (AS REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 29. SEE SPECIAL NOTE 2 ON PAGE 9.
- ③ SUPPORT CLEAT, 2" X 4" X 8-1/2" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS.
- ④ LOAD BEARING 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 4 ON PAGE 13.
- ⑦ SPACER CLEAT, 2" X 4" X 16" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d 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 "DIAGONAL BRACE A" DETAIL ON PAGE 13 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.
- ⑬ TIE WIRE, NO. 14 GAGE WIRE BY A LENGTH TO SUIT (AS REQD). WIRE TIE THE "TOP-OF-LOAD ANTI-SWAY BRACE" TO THE CENTER CLEAT ON THE SHIPPING CONTAINER OVERPACK.



SECTION D-D

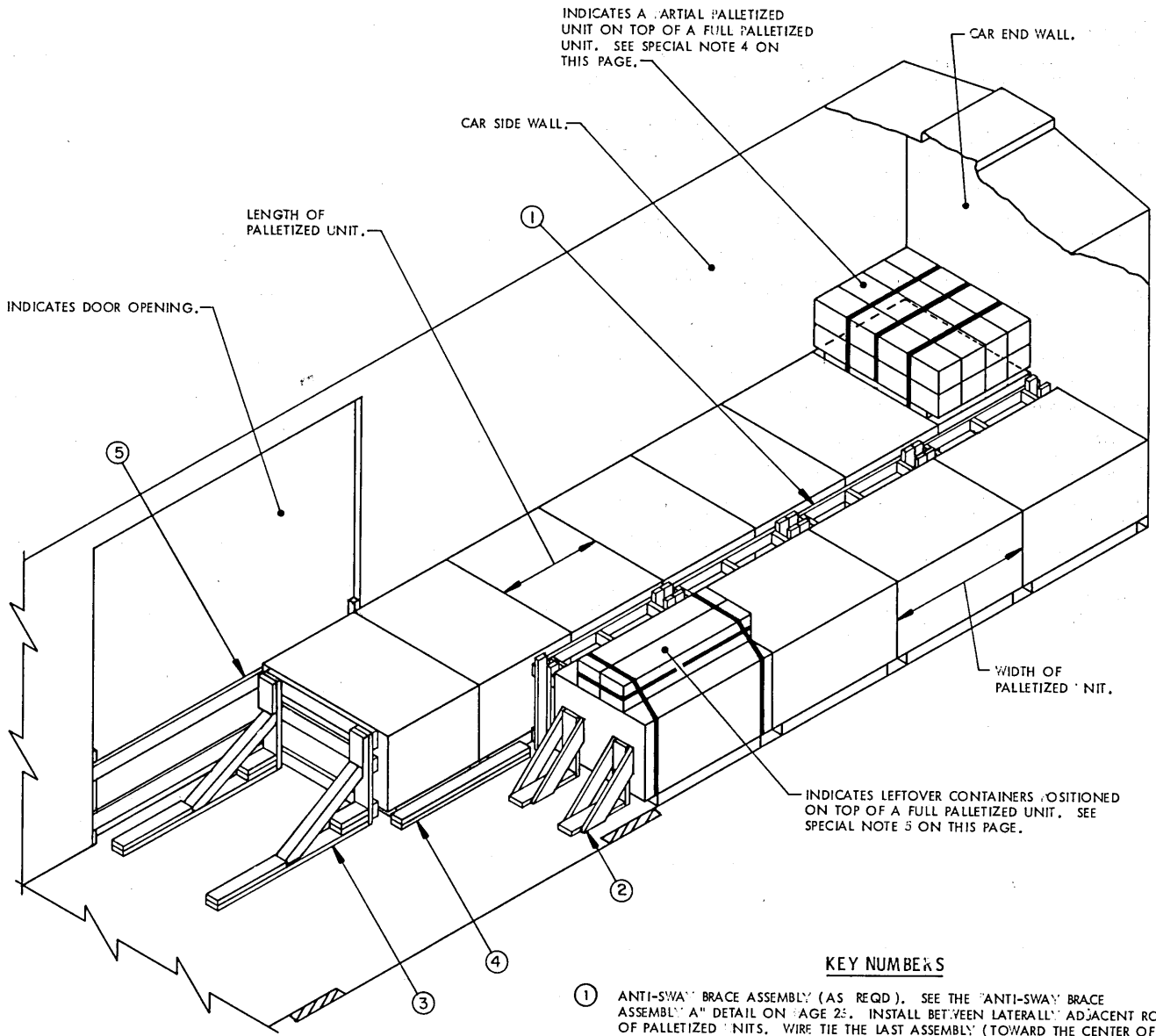
SPECIAL NOTES:

1. A TYPICAL LCL LOAD OF A PARTIAL SECOND LAYER IS SHOWN IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR HAVING A NAILABLE SIDEWALL. CARS OF OTHER WIDTHS CAN BE USED.
2. THE K-BRACE METHOD OF PARTIAL-LAYER (TIER) BRACING SHOWN MAY BE USED IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER. THE TYPE "A" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 3,000 POUNDS. THE K-BRACE METHOD SHOWN MAY BE USED AT EACH END OF THE CAR.
3. **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 DIMNAGE. PIECES MARKED ③, ④, ⑤, ⑦, ⑨, AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF 40"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.
4. 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.
5. IF THE CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31 AND GENERAL NOTE "P" ON PAGE 2.
6. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO DEPICT THE PROCEDURES ARE SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.



DIAGONAL BRACE A

2" X 4" MATERIAL. SEE KEY NUMBER ⑬ ON PAGE 12.



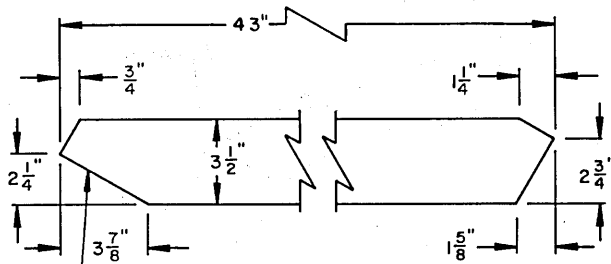
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE ASSEMBLY (AS REQD). SEE THE "ANTI-SWAY BRACE ASSEMBLY A" DETAIL ON PAGE 23. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETIZED UNITS. WIRE TIE THE LAST ASSEMBLY (TOWARD THE CENTER OF THE CAR) TO THE PALLETIZED UNIT WITH NO. 14 GAGE WIRE. SEE KEY NUMBER ⑤ ON PAGE 6, GENERAL NOTE "H" ON PAGE 2, AND SPECIAL NOTE 4 ON PAGE 7.
- ② LCL BRACE (AS REQD). SEE THE "LCL BRACE ASSEMBLY" DETAIL ON PAGE 15. POSITION AGAINST STRONG JOINTS ON THE PALLETIZED UNIT AND NAIL TO THE CAR FLOOR WITH 7-1/2" NAILS. SEE GENERAL NOTE "H" ON PAGE 2 AND SPECIAL NOTE 2 ON THIS PAGE.
- ③ KNEE BRACE ASSEMBLY (AS REQD). SEE THE "KNEE-BRACE ASSEMBLY" DETAIL ON PAGE 15 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS. SEE SPECIAL NOTE 3 ON THIS PAGE.
- ④ SIDE BLOCKING, 2" X 6" B" LENGTH-TO-SUIT (DOUBLED) (1 REQD). POSITION AGAINST THE PALLETIZED UNITS AND NAIL THE FIRST PIECE TO THE CAR FLOOR WITH 7-1/2" NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER.
- ⑤ DOORWAY PROTECTION GATE (1 REQD). SEE THE "DOORWAY PROTECTION GATE" DETAIL ON PAGE 23.

SPECIAL NOTES:

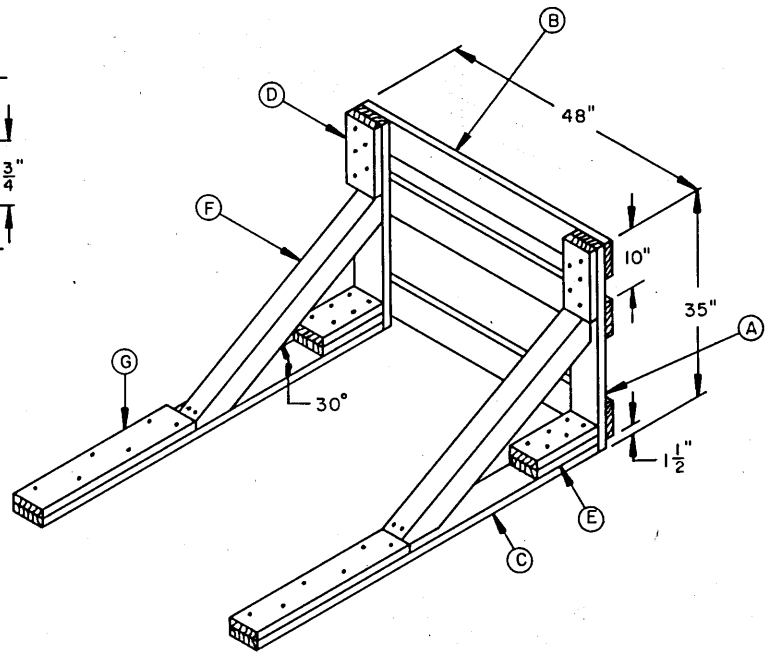
- 1. A TYPICAL LCL LOAD OF ELEVEN (11) PALLETIZED UNITS, ONE (1) PARTIAL PALLETIZED UNIT, AND TWO (2) LEFTOVER SHIPPING CONTAINERS IN OVERPACKS IS SHOWN IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR AVAILABLE METAL FLOOR. CARS OF OTHER WIDTHS CAN BE USED. THE PROCEDURES ARE ALSO APPLICABLE FOR OTHER QUANTITIES OF PALLETIZED UNITS. SEE GENERAL NOTE "I" ON PAGE 2.
- 2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL AND LATERAL BRACING.
- 3. ONE KNEE BRACE ASSEMBLY, AS SHOWN, WILL RETAIN 8,500 POUNDS.
- 4. SHIPMENTS OF PALLETIZED UNITS 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 UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE AND ON PAGE 23 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF PARTIAL UNITS.
- 5. SHIPMENTS OF PALLETIZED UNITS 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 WITHIN A LOAD. THE PROCEDURES ON THIS PAGE AND ON PAGE 24 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF LEFTOVER CONTAINERS.



THIS BRACE MUST BE INSTALLED WITH THIS BEARING SURFACE IN CONTACT WITH THE FLOOR CLEAT MARKED ©.

**DIAGONAL BRACE B**

4" X 4" MATERIAL. SEE KEY LETTER MARKED © ON THIS PAGE.

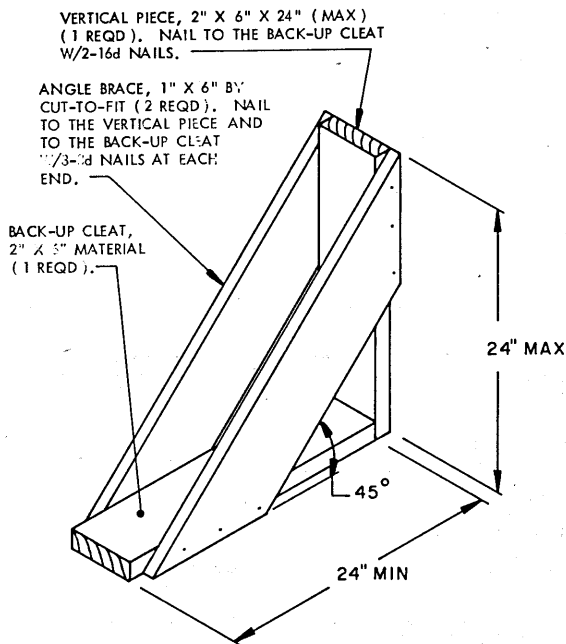


**KNEE BRACE ASSEMBLY**

THE KNEE BRACE ASSEMBLY SHOWN ABOVE AND ON PAGE 14 IS FOR USE AGAINST THE SIDE OF A PALLETIZED UNIT. IF IT IS TO BE USED AGAINST THE END OF A PALLETIZED UNIT CHANGE THE LENGTH OF PIECES MARKED © TO 41" IN LIEU OF 48" AND ALIGN THE TOP TWO PIECES MARKED © WITH THE HORIZONTAL STRAPPING BOARDS ON THE PALLETIZED UNIT.

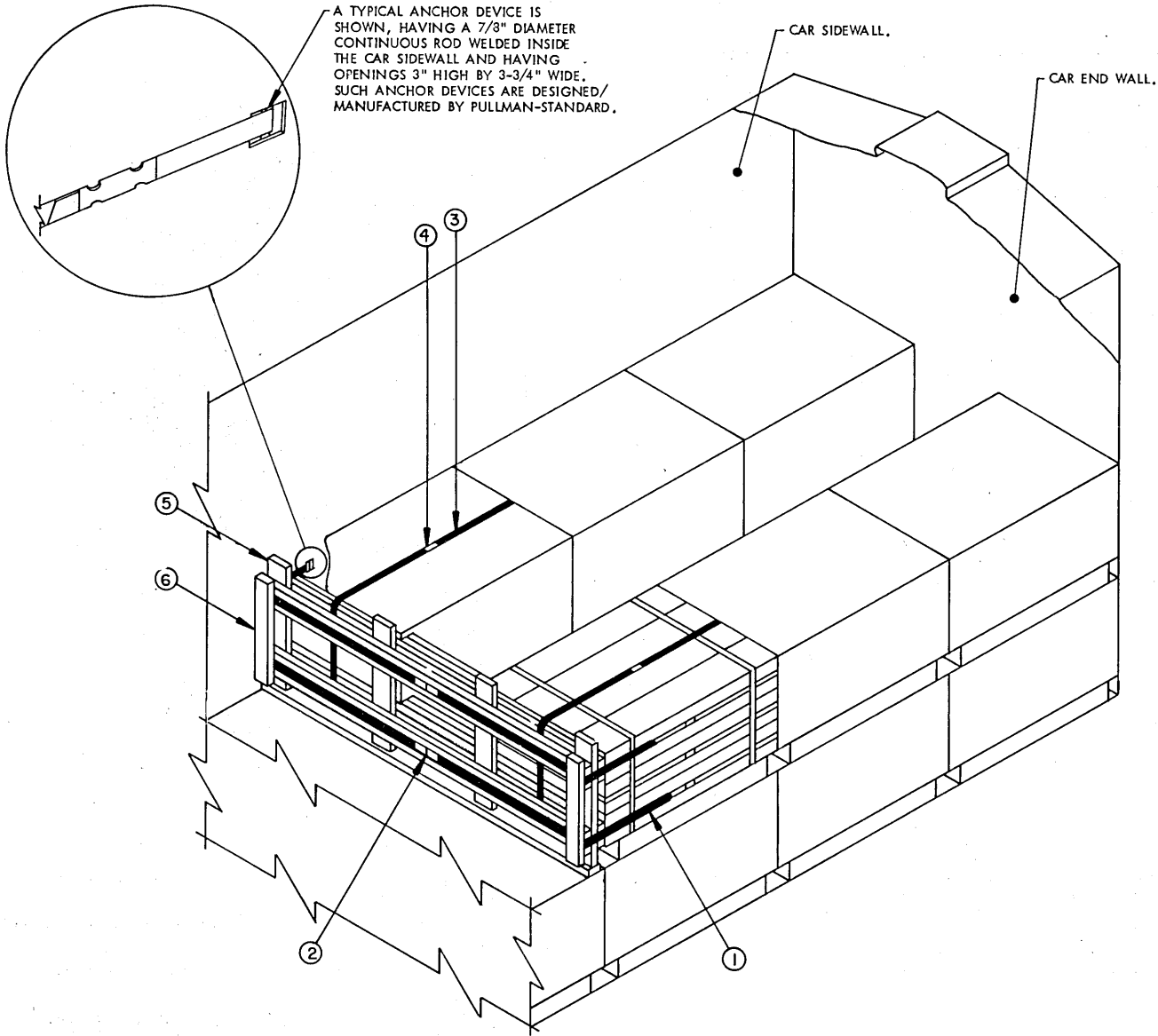
**KEY LETTERS**

- © VERTICAL PIECE, 2" X 6" X 35" (2 REQD).
- © HORIZONTAL PIECE, 2" X 6" X 48" (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.
- © FLOOR CLEAT, 2" X 6" X 67-1/4" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8".
- © HOLD-DOWN CLEAT, 2" X 6" X 12" (2 REQD). NAIL TO A VERTICAL PIECE W/5-10d NAILS.
- © POCKET CLEAT, 2" X 6" X 12" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE FLOOR CLEAT W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER AND TOENAIL IT TO THE VERTICAL PIECE W/2-15d NAILS.
- © DIAGONAL BRACE, 4" X 4" BY CUT-TO-FIT (43" REF) (2 REQD). SEE THE DETAIL ABOVE FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT W/2-15d NAILS AT EACH END.
- © BACK-UP CLEAT, 2" X 6" X 30" (2 REQD). NAIL TO THE FLOOR CLEAT W/6-40d NAILS.



**LCL BRACE ASSEMBLY**

EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. A MINIMUM OF TWO (2) LCL BRACES MUST BE USED FOR LONGITUDINAL BRACING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING.



A TYPICAL ANCHOR DEVICE IS SHOWN, HAVING A 7/8" DIAMETER CONTINUOUS ROD WELDED INSIDE THE CAR SIDEWALL AND HAVING OPENINGS 3" HIGH BY 3-3/4" WIDE. SUCH ANCHOR DEVICES ARE DESIGNED/MANUFACTURED BY PULLMAN-STANDARD.

ISOMETRIC VIEW

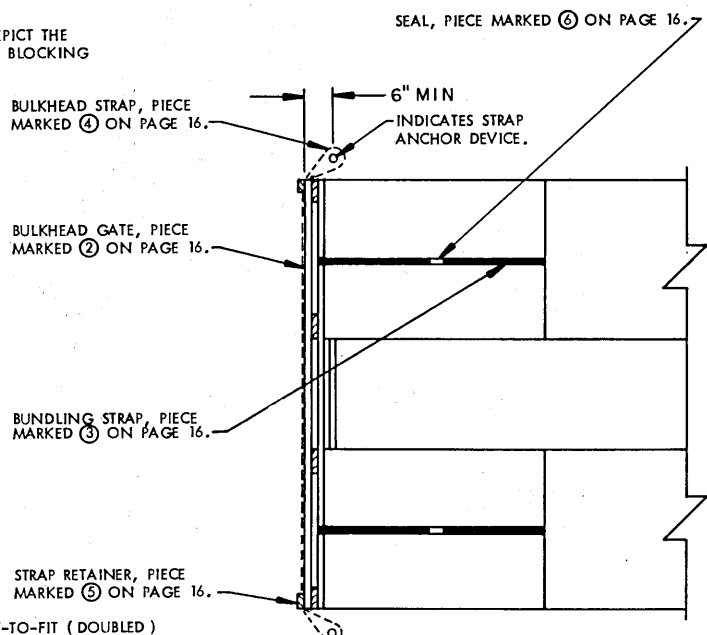
KEY NUMBERS

- ① BULKHEAD STRAP, 2" X .050" X 34'-0" LONG (REF) STEEL STRAPPING (2 REQD). INSTALL FROM TWO EQUAL LENGTH PIECES. SEE THE "LOAD PATTERN/STRAP APPLICATION PLAN" ON PAGE 17 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 AND 4 ON PAGE 17.
- ② SEAL FOR 2" STRAPPING (12 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "K" ON PAGE 2.
- ③ BUNDLING STRAP, 1-1/4" X .035" X 18'-0" LONG (REF) STEEL STRAPPING (2 REQD). ENCIRCLE PALLETIZED UNIT AND LOAD BEARING PIECES OF THE BULKHEAD GATE. SEAL THE STRAP JOINT W/1 SEAL.
- ④ SEAL FOR 1-1/4" STEEL STRAPPING (2 REQD, 1 PER STRAP). DOUBLE CRIMP EACH SEAL.
- ⑤ BULKHEAD GATE (1 REQD). SEE THE "BULKHEAD GATE" DETAIL ON PAGE 17. SEE SPECIAL NOTE 3 ON PAGE 17.
- ⑥ STRAP RETAINER, 2" X 4" BY A LENGTH-TO-SUIT (2 REQD). NAIL TO THE BULKHEAD GATE W/2-12d NAILS ABOVE AND BELOW EACH BULKHEAD STRAP.



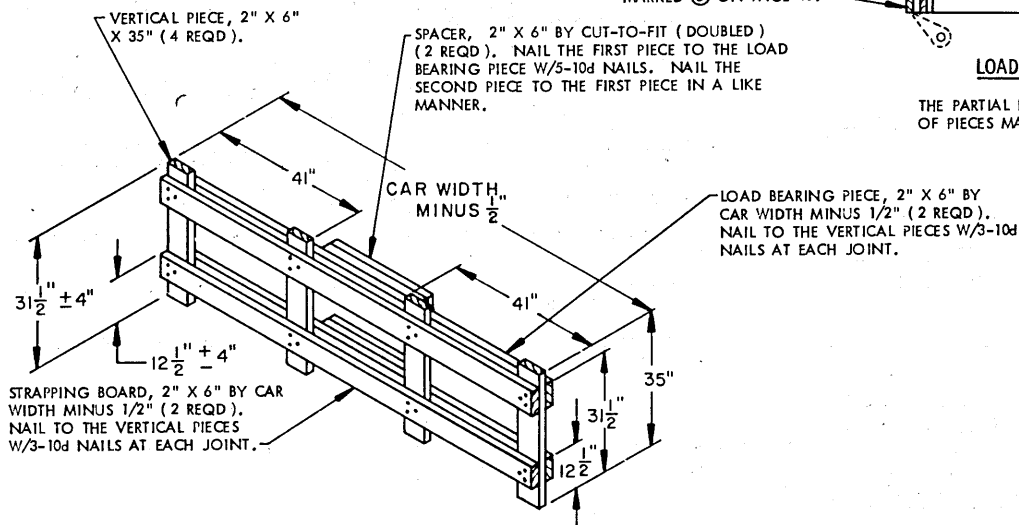
**SPECIAL NOTES:**

1. A 9'-6" 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 PROCEDURES SHOWN DEPICTING THE BULKHEAD GATE METHOD OF PARTIAL-LAYER ( TIER ) BRACING FOR THE ADJUSTMENT OF A LOAD QUANTITY IS TYPICAL.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH TWO ( 2 ) STRAPS WILL RETAIN UP TO 12,000 POUNDS OF LADING.
4. BULKHEAD STRAPS WILL BE TWO INCH ( 2" ) WIDE STEEL STRAPPING; 1-1/4" STRAPPING MUST NOT BE USED. A BULKHEAD STRAP WILL BE OF A LENGTH TO SUIT AND WILL BE THREADED THRU THE ANCHOR DEVICE ( PRIOR TO POSITIONING THE ADJACENT UNITS ) FAR ENOUGH TO PROVIDE FOR ONE LEG BEING APPROXIMATELY 48" LONGER THAN THE OTHER. THE STRAP ATTACHED TO THE MATING ANCHOR DEVICE WILL HAVE THE OPPOSITE LEG EXTENDING 48". THE TWO LEGS OF EACH HALF OF A STRAP WILL BE SECURED NEAR THE ANCHOR DEVICE WITH ONE DOUBLE CRIMPED SEAL. NOTE THAT THIS SEAL MUST BE POSITIONED EITHER CLOSE ENOUGH TO OR FAR ENOUGH AWAY FROM THE ANCHOR DEVICE SO AS NOT TO BE AT THE POINT WHERE THE STRAP BENDS AROUND THE END OF THE BULKHEAD GATE OR AROUND THE CORNER OF THE ADJACENT UNITS. THE STRAP ENDS OF EACH PAIR OF LONG AND SHORT LEGS WILL BE SECURED WITH TWO ( 2 ) SEALS BUTTED TOGETHER AND DOUBLE CRIMPED.
5. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. A TOLERANCE IS ALLOWED ON DIMENSIONS TO PROVIDE FOR THIS ALIGNMENT.
6. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO DEPICT THE PROCEDURES ARE SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
7. IF THE CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES ( 2" ) OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31 AND GENERAL NOTE "P" ON PAGE 2.



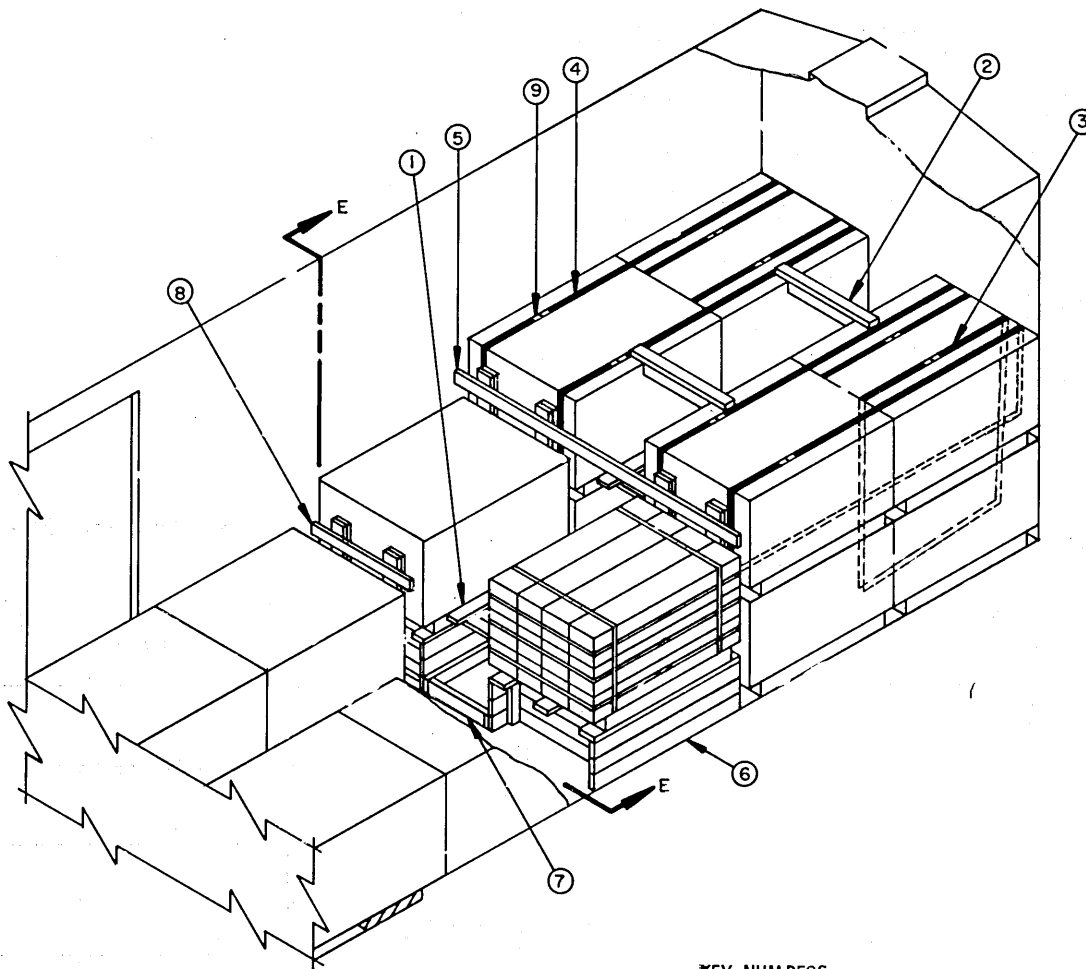
**LOAD PATTERN/STRAP INSTALLATION PLAN**

THE PARTIAL PLAN VIEW SHOWN ABOVE DEPICTS THE POSITION OF PIECES MARKED ② THROUGH ⑥ IN THE LOAD ON PAGE 16.



**BULKHEAD GATE**

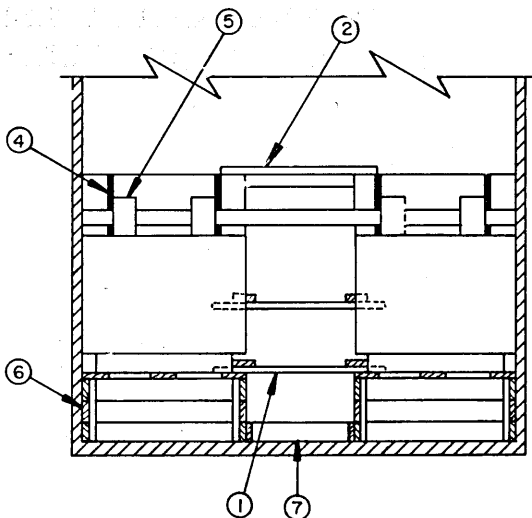
THIS GATE IS ONLY FOR USE WITH A PARTIAL-LAYER ( TIER ) OF PALLETIZED UNITS AS SHOWN IN THE LOAD ON PAGE 16.



**ISOMETRIC VIEW**

**KEY NUMBERS**

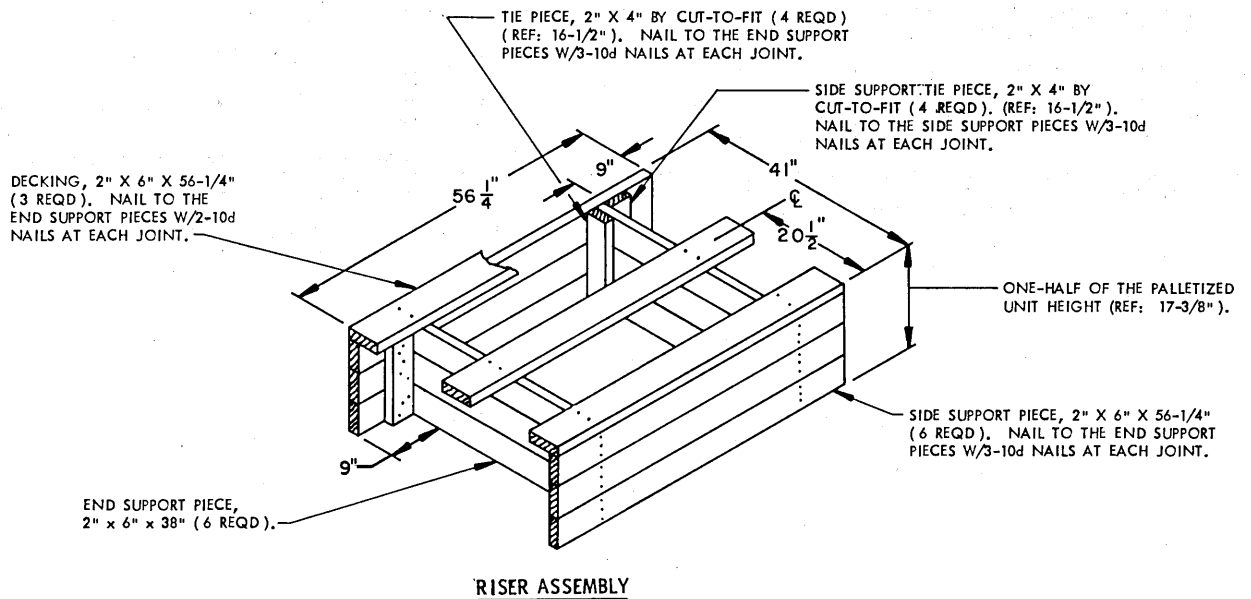
- ① ANTI-SWAY BRACE ASSEMBLY (AS REQD.). SEE THE "ANTI-SWAY BRACE ASSEMBLY B" DETAIL ON PAGE 26. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF PALLETIZED UNITS. SEE GENERAL NOTE "H" ON PAGE 2 AND SPECIAL NOTE 4 ON PAGE 9.
- ② TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY (AS REQD.). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE A" DETAIL AND "POSITIONING OF TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY" DETAIL ON PAGE 29. SEE SPECIAL NOTE 2 ON PAGE 9.
- ③ VERTICAL UNITIZING STRAP, 1-1/4" X .035" X 24'-0" LONG (REF) STEEL STRAPPING (4 REQD, 2 PER STACK). INSTALL SO AS TO ENCIRCLE THE TWO PALLETIZED UNITS, AND SEAL THE JOINT W/2 SEALS, PRIOR TO FINAL POSITIONING OF THE STACK IN THE CAR. SEE SPECIAL NOTE 3 ON PAGE 19.
- ④ HORIZONTAL UNITIZING STRAP, 1-1/4" X .035" X 26'-0" LONG (REF) STEEL STRAPPING (4 REQD). PRE-POSITION AROUND THE TOP UNIT OF THE UNITIZED 2-HIGH STACK. INSTALL SO AS TO ENCIRCLE THE TWO LONGITUDINALLY ADJACENT PALLETIZED UNITS, AND SEAL THE JOINT W/2 SEALS. SEE SPECIAL NOTE 3 ON PAGE 19.
- ⑤ SUPPORT GATE (1 REQD). SEE THE "SUPPORT GATE A" DETAIL ON PAGE 29 AND SPECIAL NOTE 6 ON PAGE 19.
- ⑥ RISER ASSEMBLY (2 REQD). SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 19 AND SPECIAL NOTE 2 ON PAGE 19.
- ⑦ RISER RETAINER ASSEMBLY (1 REQD). SEE THE "RISER RETAINER ASSEMBLY" DETAIL ON PAGE 30.
- ⑧ SUPPORT GATE (1 REQD). SEE THE "SUPPORT GATE B" DETAIL ON PAGE 29 AND SPECIAL NOTE 6 ON PAGE 19.
- ⑨ SEAL FOR 1-1/4" STRAPPING (16 REQD, 2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "K" ON PAGE 2.

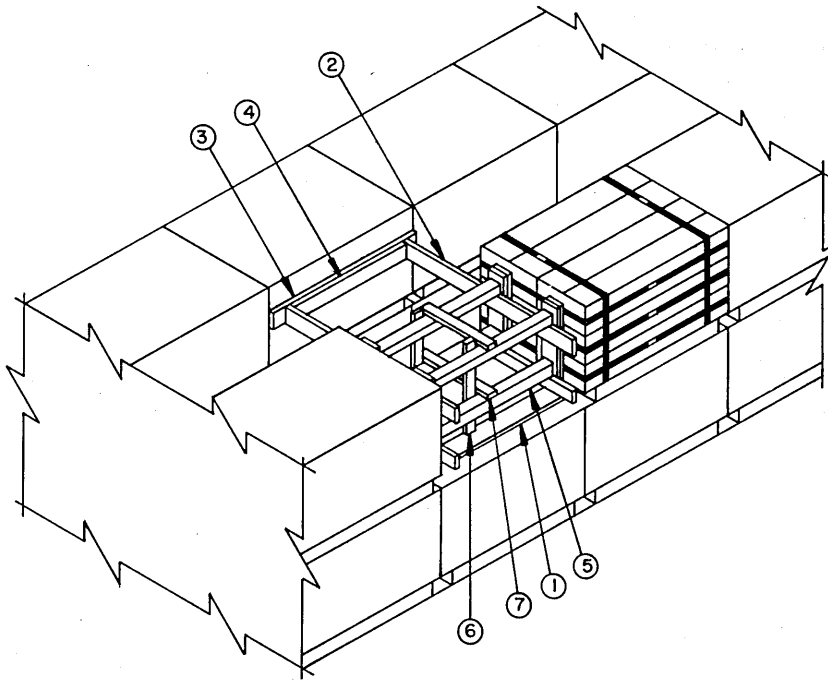


**SECTION E-E**

**SPECIAL NOTES:**

1. A TYPICAL LCL LOAD OF A PARTIAL SECOND LAYER IS SHOWN IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR. ALL METAL OR WOOD-LINED CARS OF OTHER WIDTHS CAN BE USED.
2. THE RISER METHOD OF PARTIAL-LAYER BRACING MAY BE USED IN ALL-METAL CARS OR IN WOOD-LINED CARS FOR THE SECUREMENT OF A PARTIAL TOP TIER OF NOT MORE THAN 16,000 POUNDS ( 8,000 POUNDS IN EACH ROW WHICH IS RETAINED BY A RISER ). THE RISER MUST ALWAYS BE POSITIONED ON THE CAR FLOOR.
3. THE POSITIONING OF THE VERTICAL UNITIZING STRAPS MARKED ③ AND THE HORIZONTAL UNITIZING STRAPS MARKED ④, IS APPLICABLE FOR LCL LOADS WHICH ARE AT LEAST TWO LOAD UNITS LONG IN THE UPPERMOST TIER. IF THE UPPERMOST TIER IS ONLY ONE LOAD UNIT IN LENGTH, PIECE MARKED ③ WILL BE INSTALLED SO AS TO ENCIRCLE A STACK IN THAT LOAD UNIT AND PIECES MARKED ④ WILL NOT BE REQUIRED.
4. IF THE CAR BEING LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD TWO INCHES (2") OR MORE 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. SEE THE "BOWED END WALL PROVISIONS" DETAIL ON PAGE 31 AND GENERAL NOTE "P" ON PAGE 2.
5. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO DEPICT THE PROCEDURES ARE SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
6. SUPPORT GATES ARE REQUIRED BETWEEN THE LONGITUDINAL ADJACENT PALLETIZED UNITS NEXT TO THE RISER ASSEMBLY FOR BETTER LOAD BEARING DISTRIBUTION.





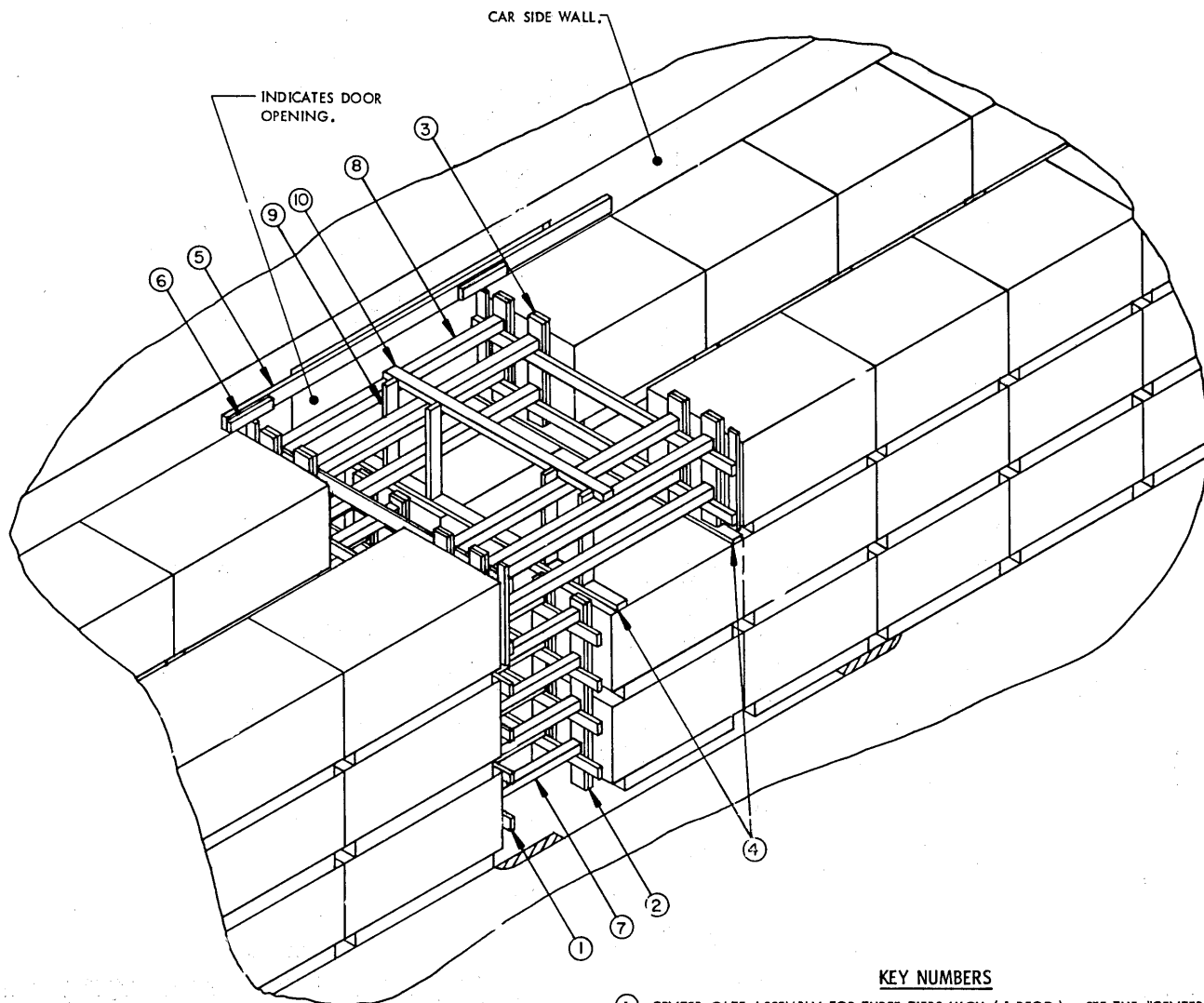
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

1. A PARTIAL VIEW OF A LOAD IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR, HAVING ONE PALLETIZED UNIT OMITTED FROM THE TOP LAYER, IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THIS METHOD OF PARTIAL-LAYER (TIER) BRACING (OMITTING A UNIT FROM THE TOP TIER FOR ADJUSTMENT OF THE LOAD QUANTITY) IS APPLICABLE FOR USE IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS AS WELL AS CONVENTIONAL BOX CARS. THIS METHOD MAY ALSO BE USED IN A ONE LAYER LOAD.
3. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA OF THE CAR. ALSO, THERE SHOULD BE AT LEAST ONE (1) PALLETIZED UNIT BETWEEN THE OMITTED UNIT AND A LOAD DIVIDER BULKHEAD, OR BETWEEN THE OMITTED UNIT AND A CENTER GATE FOR A LOAD IN A CONVENTIONAL TYPE BOX CAR.
4. ONLY THE BLOCKING AND BRACING FOR THE OMITTED PALLETIZED UNIT IS SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

**KEY NUMBERS**

- ① SUPPORT PIECE, 1" X 6" X 64" (2 REQD). POSITION ON TOP OF THE BOTTOM PALLETIZED UNIT. SEE KEY NUMBER ② ON THIS PAGE.
- ② LOAD BEARING GATE (2 REQD). SEE THE "LOAD BEARING GATE" DETAIL ON PAGE 30. POSITION WITH VERTICAL PIECES ON TOP OF PIECES MARKED ①. NAIL TO THE FILLER PIECE MARKED ④ W/3-10d NAILS. TO ENAIL TO THE SUPPORT PIECE MARKED ① W/2-6d NAILS AT EACH JOINT.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 56" (1 REQD). POSITION AS SHOWN.
- ④ FILLER PIECE, 2" X 6" BY CUT-TO-FIT (1 REQD). NAIL TO PIECE MARKED ③ W/5-10d NAILS.
- ⑤ STRUT, 4" X 4" BY CUT-TO-FIT (4 REQD). TO ENAIL TO PIECE MARKED ② W/2-12d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" BY CUT-TO-FIT (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT. THE BOTTOM END OF THIS PIECE WILL REST ON TOP OF THE SUPPORT PIECE MARKED ①.
- ⑦ HORIZONTAL STRUT BRACING, 2" X 4" BY CUT-TO-FIT (2 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.



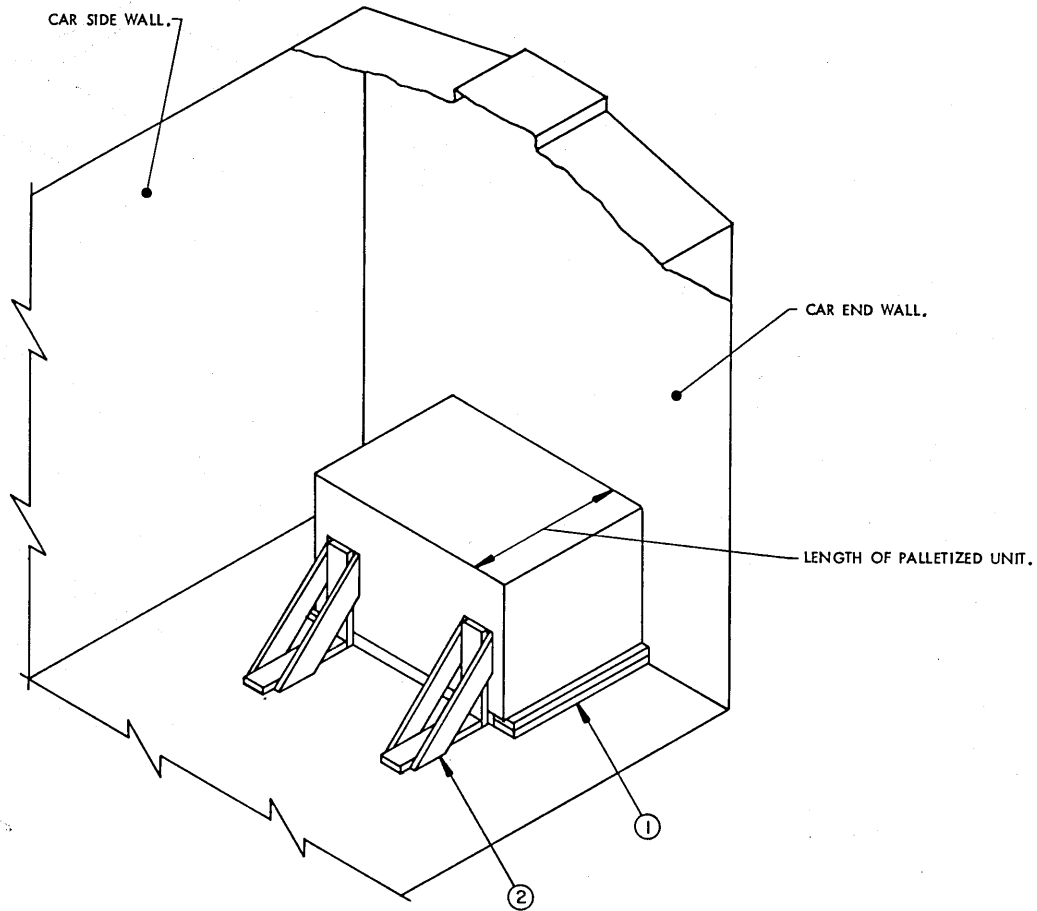
**ISOMETRIC VIEW**

**SPECIAL NOTES:**

1. THE CENTER PORTION OF A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOX CAR EQUIPPED WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING WIDER OR NARROWER DOOR OPENINGS CAN BE USED.
2. THE PROCEDURES FOR THE ADJUSTMENT OF A LOAD QUANTITY BY THE OMISSION OF TWO ADJACENT PALLETIZED UNITS FROM THE TOP TIER ARE SHOWN AS TYPICAL.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP TIER ARE SHOWN; REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.
4. THE LENGTH OF THE STRUTS MAY REQUIRE THAT MORE THAN ONE SET OF VERTICAL STRUT BRACING BE INSTALLED. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER TIER OF A LOAD, A SUPPORT PIECE, SHOWN AS PIECE MARKED ④, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE, SHOWN AS PIECE MARKED ②. SEE GENERAL NOTE "V" ON PAGE 2.
5. FOUR (4) LOAD BLOCKING 4" X 4" STRUTS FOR EACH ROW/TIER ARE ADEQUATE FOR RETAINING A WEIGHT OF 12,250 POUNDS.

**KEY NUMBERS**

- ① CENTER GATE ASSEMBLY FOR THREE TIERS HIGH (1 REQD). SEE THE "CENTER GATE ASSEMBLY C" DETAIL ON PAGE 23.
- ② CENTER GATE ASSEMBLY FOR TWO TIERS HIGH (1 REQD). SEE THE "CENTER GATE ASSEMBLY C" DETAIL ON PAGE 23.
- ③ CENTER GATE ASSEMBLY FOR ONE TIER HIGH (1 REQD). SEE THE "CENTER GATE ASSEMBLY C" DETAIL ON PAGE 23. TOENAIL TO PIECE MARKED ④ W/2-12d NAILS AT EACH JOINT. SEE SPECIAL NOTE 4 ON THIS PAGE.
- ④ SUPPORT PIECE, 2" X 4" BY CAR WIDTH MINUS 1/2" (2 REQD). POSITION ONE PIECE UNDER THE VERTICAL STRUT BRACING MARKED ⑨ AND ONE PIECE UNDER THE CENTER GATE ASSEMBLY MARKED ③. SEE SPECIAL NOTE 4 ON THIS PAGE.
- ⑤ CENTER GATE HOLD-DOWN, 2" X 6" BY DOOR OPENING WIDTH PLUS 24" (2 REQD). NAIL TO THE CAR SIDEWALL W/5-12d NAILS AT EACH END.
- ⑥ CENTER GATE HOLD-DOWN CLEAT, 2" X 4" X 13" (4 REQD). CENTER THE CLEATS ABOVE THE HOLD-DOWN PIECES ON THE GATE AND NAIL TO THE CENTER GATE HOLD-DOWN MARKED ⑤ W/5-10d NAILS.
- ⑦ STRUT, 4" X 4" BY CUT-TO-FIT (16 REQD). TOENAIL TO PIECES MARKED ① AND ② W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON THIS PAGE.
- ⑧ STRUT, 4" X 4" BY CUT-TO-FIT (8 REQD). TOENAIL TO PIECES MARKED ① AND ③ W/2-16d NAILS AT EACH END. SEE SPECIAL NOTE 5 ON THIS PAGE.
- ⑨ VERTICAL STRUT BRACING, 2" X 4" BY CUT-TO-EXTEND 3" ABOVE THE TOP STRUT (4 REQD). NAIL TO THE STRUTS MARKED ⑧ W/3-10d NAILS AT EACH JOINT. TOENAIL TO PIECE MARKED ④ W/2-12d NAILS AT EACH JOINT.
- ⑩ HORIZONTAL STRUT BRACING, 2" X 4" BY CAR WIDTH MINUS 1/2" IN LENGTH (1 REQD). NAIL TO THE STRUTS MARKED ⑧ W/3-10d NAILS AT EACH JOINT.



ISOMETRIC VIEW

KEY NUMBERS

- ① SIDE BLOCKING, 2" X 6" X 40" ( DOUBLED ) ( 2 REQD ), PRE-POSITION AND NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST PIECE IN A LIKE MANNER.
- ② LCL BRACE ( 2 REQD ). SEE THE "LCL BRACE" DETAIL ON PAGE 15. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "H" ON PAGE 2 AND SPECIAL NOTE 2 ON THIS PAGE.

SPECIAL NOTES:

- 1. A TYPICAL LCL LOAD OF ONE ( 1 ) PALLETIZED UNIT IS SHOWN IN A 9'-2" WIDE CONVENTIONAL TYPE BOX CAR HAVING A WOOD OR NAILABLE METAL FLOOR. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "T" ON PAGE 2.
- 2. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO ( 2 ) BRACES MUST BE USED FOR LONGITUDINAL BRACING.
- 3. IF DESIRED, ONE LCL BRACE MAY BE POSITIONED AT EACH END OF THE PALLETIZED UNIT IN LIEU OF THE SIDE BLOCKING, PIECES MARKED ①.
- 4. SEE THE LOAD ON PAGE 14 WHEN BLOCKING MORE THAN ONE PALLETIZED UNIT.

SEAL FOR 1-1/4" STEEL STRAPPING  
(6 REQD, 2 PER STRAP). DOUBLE  
CRIMP EACH SEAL.

41" LONG

FIGURE-8 UNITIZING STRAP, 1-1/4" X .035"  
BY LENGTH-TO-SUIT STEEL STRAPPING (1  
REQD). POSITION NEAR THE CENTER OF  
THE PALLETIZED UNIT WIDTH, NOTE THAT  
THE STRAP PASSES UNDER THE TOP DECK  
OF THE PALLET BASE FOR THE TOP UNIT.

56 3/8" WIDE

INDICATES A TYPICAL  
2-LAYER PALLETIZED UNIT.

25 1/4"

VERTICAL UNITIZING STRAP, 1-1/4"  
X .035" BY LENGTH-TO-SUIT STEEL  
STRAPPING (2 REQD). POSITION  
AGAINST THE POST ON THE PALLET  
BASE, AS SHOWN.

60"

34 3/4"

INDICATES A FULL-HEIGHT LOWER  
TER PALLETIZED UNIT.

INDICATES THE HORIZONTAL STRAP  
ON THE PALLETIZED UNIT.

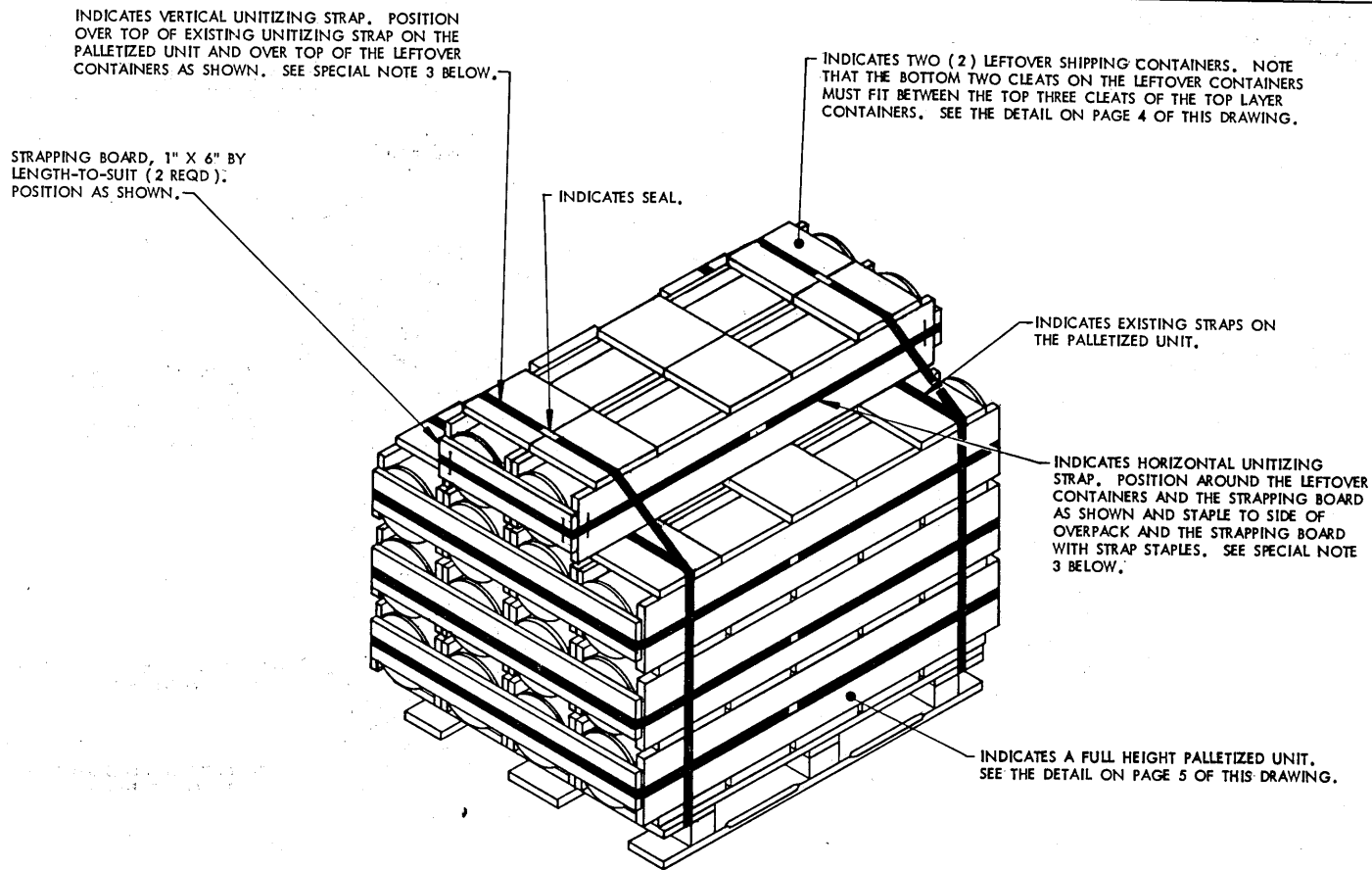
48"

40"

**SECUREMENT OF A PARTIAL PALLETIZED UNIT  
ON TOP OF A FULL PALLETIZED UNIT**

**SPECIAL NOTES:**

1. SHIPMENTS OF PALLETIZED UNITS 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 PALLETIZED UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE AND ON PAGES (14) AND (25) ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL UNITS.
2. THE PARTIAL PALLETIZED UNIT WILL BE STRAPPED TO THE PALLETIZED UNIT DIRECTLY BELOW WITH TWO (2) VERTICAL UNITIZING STRAPS AND A FIGURE-8 UNITIZING STRAP, AS SHOWN ABOVE. PLACEMENT WITHIN THE LOAD IS OPTIONAL.
3. THE "SHIPMENT OF A PARTIAL PALLETIZED UNIT" PROCEDURES ON THIS PAGE ARE APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS AS WELL AS FOR LOADS IN CONVENTIONAL BOX CARS.
4. FOR SHIPMENT OF "LEFTOVER" CONTAINERS, SEE THE PROCEDURES ON PAGE 24.
5. SEE PAGE 14 FOR USE WITHIN A LOAD.

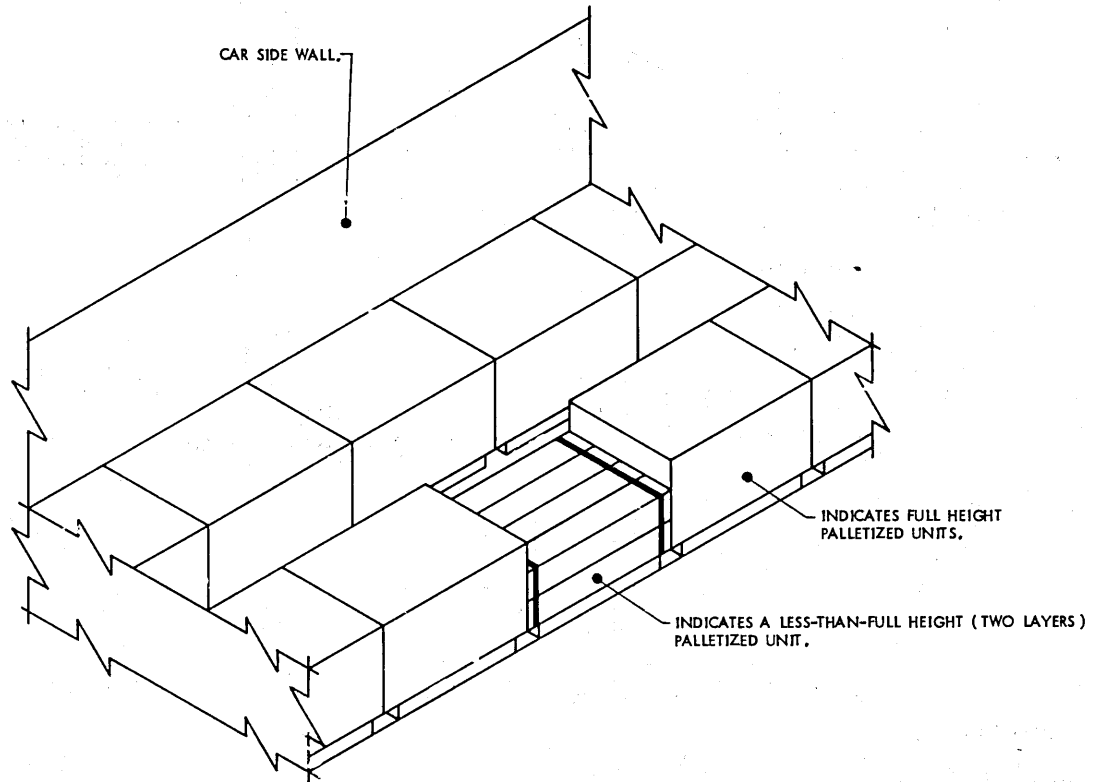


SECUREMENT OF LEFTOVER CONTAINERS

SPECIAL NOTES:

1. SHIPMENTS OF PALLETIZED UNITS 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.
2. THE QUANTITY OF LEFTOVER CONTAINERS WHICH CAN BE SECURED TO A FULL HEIGHT PALLETIZED UNIT WILL NOT EXCEED THREE. IF FOUR LEFTOVER CONTAINERS ARE TO BE SHIPPED, TWO CONTAINERS WILL BE SECURED TO THE TOP OF ONE PALLETIZED UNIT AND TWO CONTAINERS WILL BE SECURED TO THE TOP OF A DIFFERENT PALLETIZED UNIT.
3. LEFTOVER CONTAINERS MUST BE SECURED TO A FULL HEIGHT PALLETIZED UNIT WITH TWO (2) PIECES OF STEEL STRAPPING (SEPARATE FROM UNIT STRAPS) OF A SIZE AT LEAST AS HEAVY AS THE UNITIZING STRAPPING. THREAD A STRAP UNDER THE TOP DECK BOARDS IN LINE WITH EXISTING UNITIZING STRAPS, COMPLETELY ENCIRCLE THE PALLETIZED UNIT AND LEFTOVER CONTAINERS, TENSION, AND SEAL THE STRAP JOINT WITH ONE DOUBLE CRIMPED SEAL. ONE (1) PIECE OF STEEL STRAPPING OF A SIZE AT LEAST AS HEAVY AS THE UNITIZING STRAPPING MUST ENCIRCLE THE LEFTOVER CONTAINERS HORIZONTALLY AS SHOWN ABOVE.
4. LEFTOVER CONTAINERS MAY ALSO BE SECURED ON TOP OF A PARTIAL PALLETIZED UNIT.
5. SHIPMENT OF LEFTOVER CONTAINERS IS APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOTS TO POSTS, CAMPS, AND STATIONS, OR UPON APPROVAL FROM HIGHER HEADQUARTERS, FOR SHIPMENTS FROM LOAD, ASSEMBLE AND PACK PLANTS TO DEPOTS. CAUTION: A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A FULL OR PARTIAL UNIT MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.

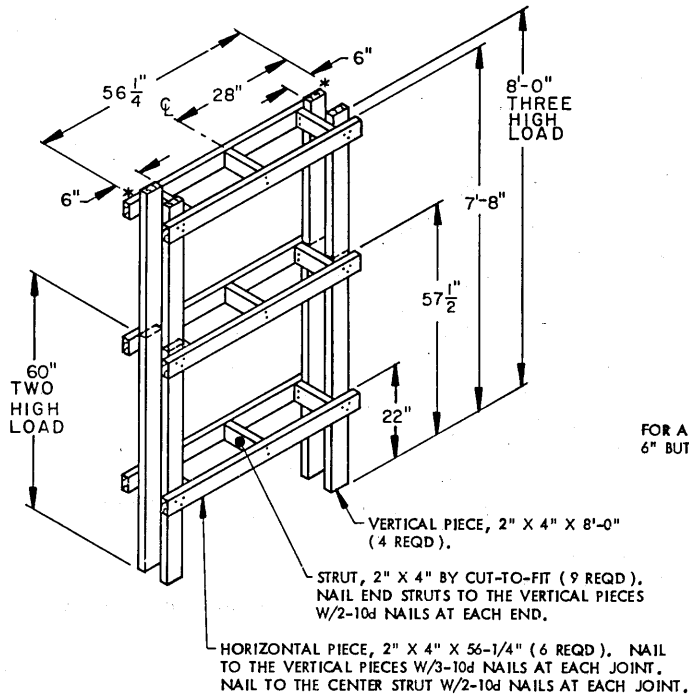




#### POSITIONING OF A PARTIAL PALLETIZED UNIT WITHIN A TIER

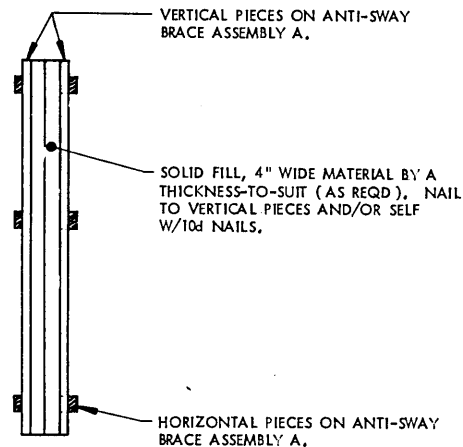
**SPECIAL NOTES:**

1. THE ISOMETRIC VIEW SHOWN ABOVE DEPICTS A PARTIAL PALLETIZED UNIT POSITIONED WITHIN A LOAD OF FULL PALLETIZED UNITS.
2. FOR SECUREMENT OF A PARTIAL PALLETIZED UNIT ON TOP OF A FULL-HEIGHT PALLETIZED UNIT, SEE PAGES 14 AND 23.
3. SHIPMENT OF PALLETIZED UNITS 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 UNITS WITHIN A LOAD. THE PROCEDURES ON THIS PAGE AND ON PAGE 14 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL UNITS.
4. THE PROCEDURES SHOWN ON THIS PAGE ARE ONLY APPLICABLE TO PARTIAL PALLETIZED UNITS CONSISTING OF TWO LAYERS OF CONTAINERS. FOR SHIPMENT OF A ONE LAYER PALLETIZED UNIT, POSITION ON TOP OF A FULL PALLETIZED UNIT AS SHOWN ON PAGE 14. FOR SHIPMENT OF "LEFTOVER" CONTAINERS, SEE THE PROCEDURES ON PAGES 14 AND 24.
5. LEFTOVER CONTAINERS ( ONE TO THREE CONTAINERS IN OVERPACKS AS SHOWN ON PAGE 4 OF THIS DRAWING ) CAN BE SECURED TO THE TOP OF A PARTIAL UNIT FOR PLACEMENT WITHIN A TIER, WITH THESE LIMITATIONS:
  - A. LEFTOVER CONTAINERS ON TOP OF A PARTIAL UNIT ARE APPLICABLE FOR CONUS AND OCONUS RAILROAD SHIPMENTS FROM DEPOT TO DEPOT OR FROM DEPOTS TO POSTS, CAMPS, AND STATIONS, OR, UPON APPROVAL FROM HIGHER HEAD-QUARTERS. FOR SHIPMENTS FROM LOAD, ASSEMBLE, AND PACK PLANTS TO DEPOTS. **CAUTION:** A LOAD CONTAINING LEFTOVER CONTAINERS IN AN AMOUNT WHICH IS LESS THAN A FULL LAYER, AND SECURED TO THE TOP OF A PARTIAL UNIT, MUST NOT BE DESTINED FOR SHIPMENT OVERSEAS BY WATER CARRIER.
  - B. THE LEFTOVER CONTAINERS MUST BE SECURED TO THE PARTIAL UNIT WITH THEIR OWN STRAPPING, SEPARATE FROM THE STRAPS FOR THE PARTIAL UNIT. SEE THE DETAILS ON PAGE 24 FOR GUIDANCE IN STRAP APPLICATION.
6. **CAUTION:** THE PARTIAL UNIT MUST BE LOCATED IN THE TOP TIER OF A LOAD; OTHER UNITS MUST NOT BE PLACED ON TOP OF THE PARTIAL UNIT. THE PARTIAL UNIT SHOULD BE PLACED IN THE LOAD SO THAT THERE IS AT LEAST ONE ( 1 ) FULL-HEIGHT UNIT BETWEEN IT AND THE CENTER GATE; HOWEVER, THE PARTIAL UNIT IS NOT TO BE WITHIN A LOAD UNIT WHICH IS TO BE ENCIRCLED WITH DOORWAY PROTECTION STRAPS.
7. THE "POSITIONING OF A PARTIAL PALLETIZED UNIT WITHIN A TIER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOX CAR LOAD. HOWEVER, THE "SHIPMENT OF PARTIAL UNITS" PROCEDURES ON THIS PAGE ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.



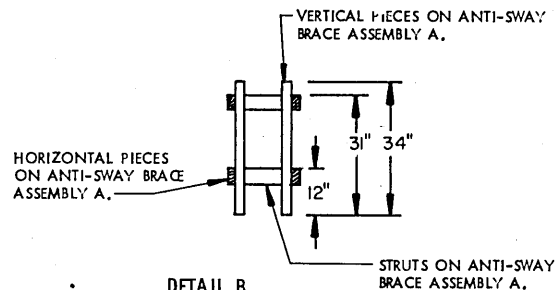
**ANTI-SWAY BRACE ASSEMBLY A**

THIS BRACE IS FOR USE BETWEEN LATERALLY ADJACENT PALLETIZED UNITS HAVING A MINIMUM SPACE OF 9" AND A MAXIMUM SPACE OF 18" BETWEEN UNITS. IF THE SPACE IS 18" OR MORE, SEE "ANTI-SWAY BRACE ASSEMBLY B" BELOW. IF THE SPACE IS GREATER THAN 6" BUT LESS THAN 9", SEE "DETAIL A" ABOVE. IF THE LOAD IS ONLY ONE LAYER HIGH, SEE "DETAIL B" FOR MODIFICATION OF "ANTI-SWAY BRACE ASSEMBLY A".



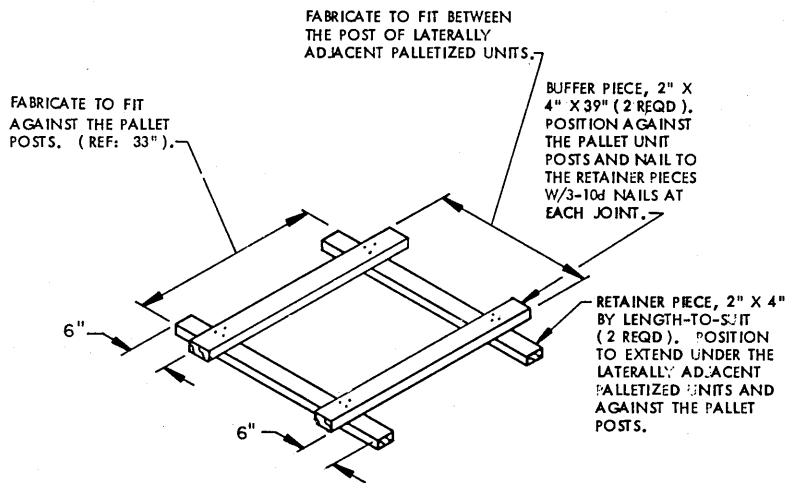
**DETAIL A**

FOR A VOID WHICH IS GREATER THAN 6" BUT LESS THAN 9".



**DETAIL B**

FOR LOADS WHICH ARE ONE PALLETIZED UNIT IN HEIGHT AND HAVING A SPACE OF 18" OR MORE BETWEEN LATERALLY ADJACENT PALLETIZED UNITS.

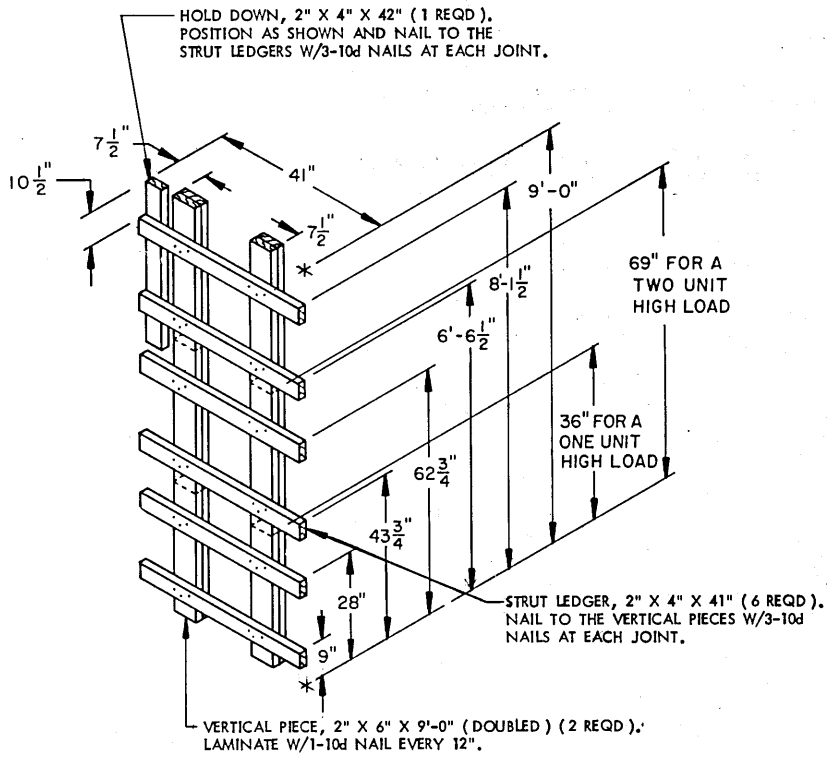


**ANTI-SWAY BRACE ASSEMBLY B**

THIS BRACE IS FOR USE BETWEEN LATERALLY ADJACENT PALLETIZED UNITS HAVING A MINIMUM SPACE OF 1" BETWEEN UNITS. SEE THE "POSITIONING OF ANTI-SWAY BRACE ASSEMBLY B" ON THIS PAGE.

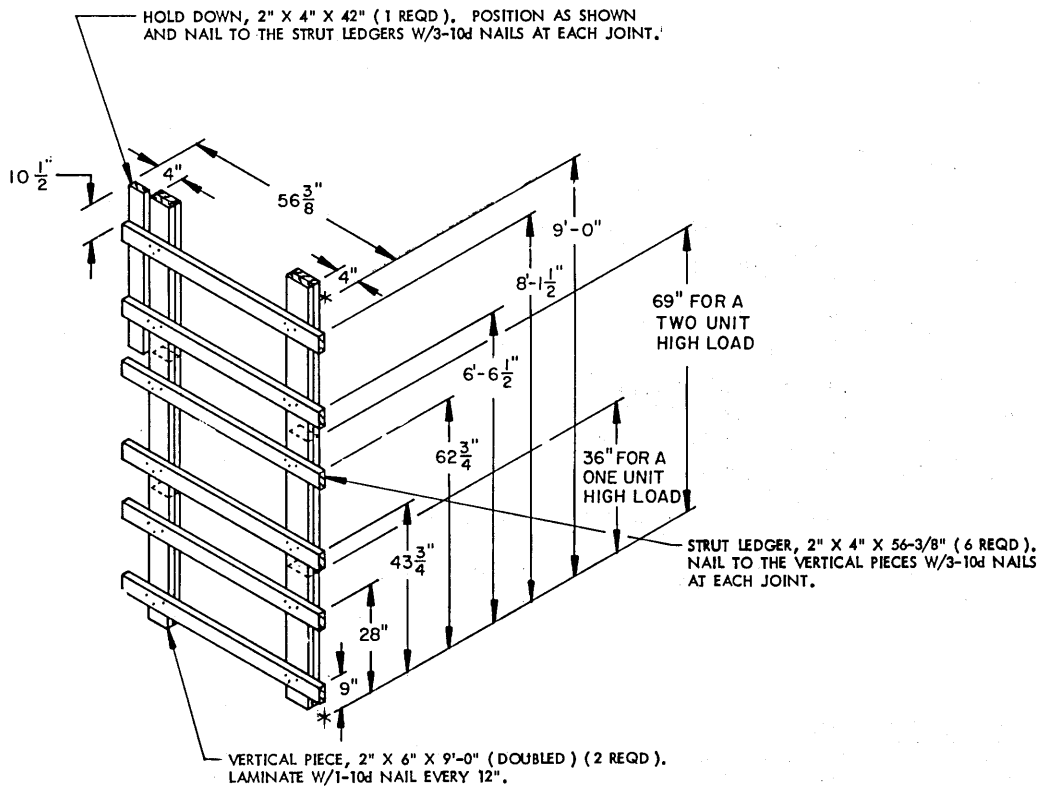
**POSITIONING OF ANTI-SWAY BRACE ASSEMBLY B:**

1. THE "ANTI-SWAY BRACE ASSEMBLY B" MUST BE FABRICATED IN PLACE BETWEEN LATERALLY ADJACENT PALLETIZED UNITS, POSITIONED WITH THE 56-3/8" DIMENSION PARALLEL TO THE CAR SIDE WALL.
  - A. POSITION THE FIRST RETAINER PIECE BETWEEN THE CENTER PALLET POST AND THE PALLET POST WHICH IS FURTHEST AWAY. THE RETAINER PIECE IS TO SPAN THE VOID BETWEEN LATERALLY ADJACENT PALLETIZED UNITS AND REST ON THE BOTTOM BOARDS OF THE PALLETIZED UNITS.
  - B. POSITION A 2" X 4" X 39" BUFFER PIECE 6" FROM THE END OF THE FIRST RETAINER PIECE AND EXTENDING 3" BEYOND THE EDGE OF THE FIRST RETAINER PIECE. NAIL THE BUFFER PIECE TO THE RETAINER PIECE W/3-10d NAILS.
  - C. KEEPING THE FIRST BUFFER PIECE AGAINST THE SIDE OF A PALLETIZED UNIT, POSITION THE SECOND BUFFER PIECE AGAINST THE SIDE OF THE LATERALLY ADJACENT PALLETIZED UNIT AND EXTENDING 3" BEYOND THE EDGE OF THE FIRST RETAINER PIECE. NAIL THE BUFFER PIECE TO THE RETAINER PIECE W/3-10d NAILS.
  - D. HOLD THE ENDS OF BOTH BUFFER PIECES AND PUSH THE PARTIAL ASSEMBLY FORWARD UNTIL THE FIRST RETAINER PIECE CONTACTS THE PALLETIZED UNIT POSTS ON THE FAR END.
  - E. POSITION THE SECOND RETAINER PIECE AGAINST THE INSIDE OF THE NEAREST PALLET POST. THE RETAINER PIECE IS TO SPAN THE VOID BETWEEN LATERALLY ADJACENT PALLETIZED UNITS AND REST ON THE BOTTOM BOARDS OF THE PALLETIZED UNITS.
  - F. KEEP THE TWO BUFFER PIECES AGAINST THE SIDES OF THE LATERALLY ADJACENT PALLETIZED UNITS AND NAIL EACH ONE TO THE SECOND RETAINER PIECE W/3-10d NAILS.



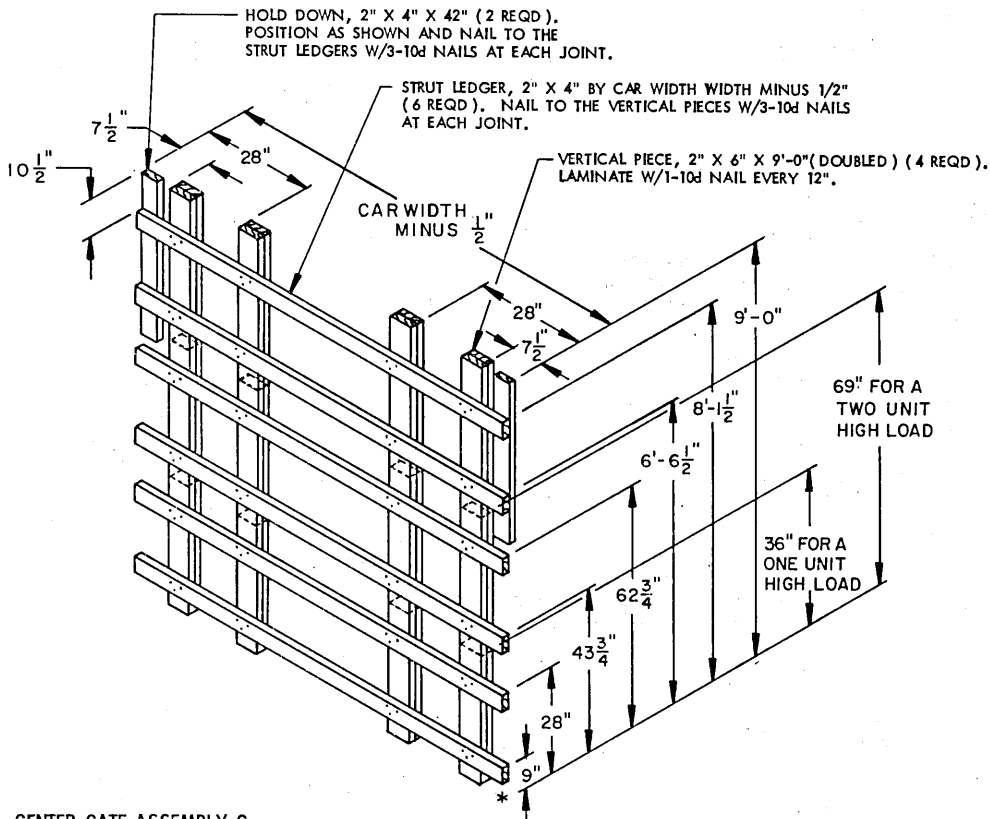
**CENTER GATE ASSEMBLY A**

THE GATE SHOWN ABOVE IS FOR A THREE UNIT HIGH LOAD. DIMENSIONS ARE ALSO GIVEN FOR A TWO OR ONE UNIT HIGH LOAD. THIS GATE IS FOR USE AGAINST THE END (41" LENGTH) OF THE PALLETIZED UNIT IN A COMBINATION LOAD SUCH AS SHOWN ON PAGE 6.



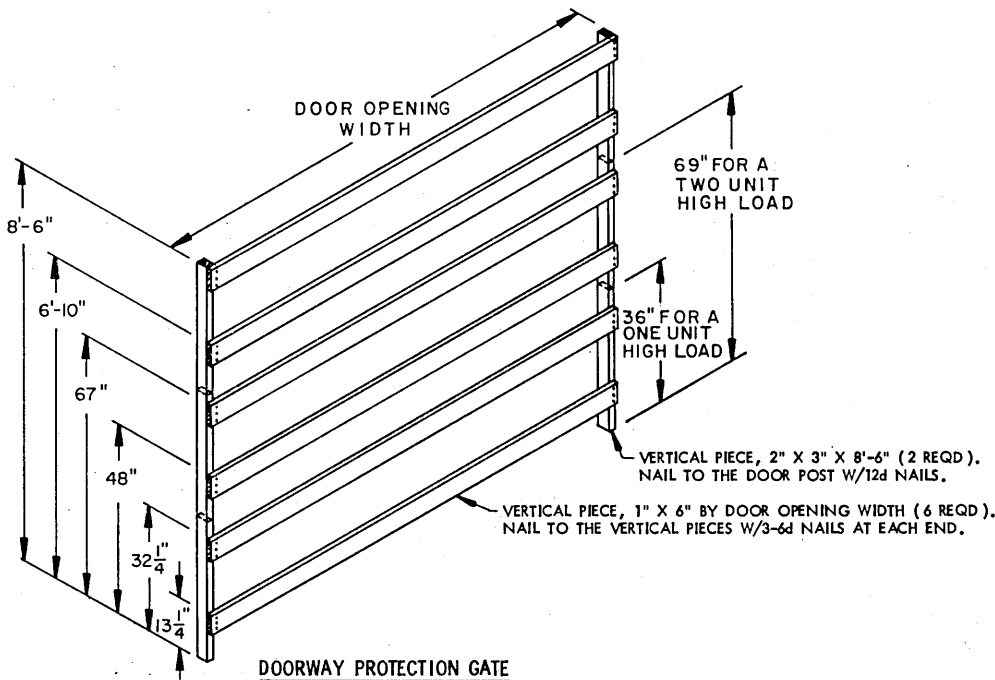
**CENTER GATE ASSEMBLY B**

THE GATE SHOWN ABOVE IS FOR A THREE UNIT HIGH LOAD. DIMENSIONS ARE ALSO GIVEN FOR A TWO OR ONE UNIT HIGH LOAD. THIS GATE IS FOR USE AGAINST THE SIDE (56-3/8" WIDTH) OF THE PALLETIZED UNIT IN A COMBINATION LOAD SUCH AS SHOWN ON PAGE 6.



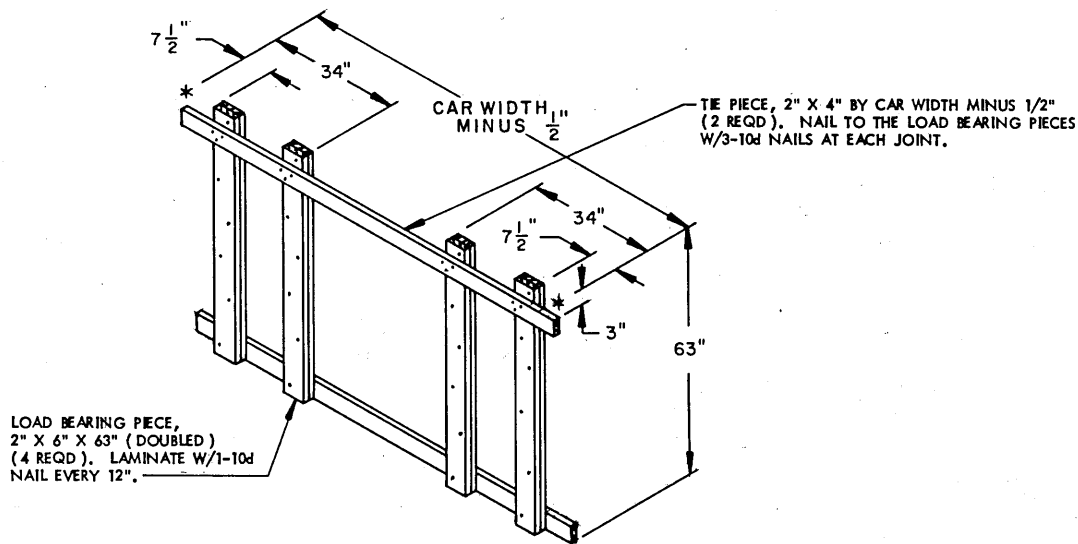
**CENTER GATE ASSEMBLY C**

THE GATE SHOWN ABOVE IS FOR A THREE UNIT HIGH LOAD. DIMENSIONS ARE ALSO GIVEN FOR A TWO OR ONE UNIT HIGH LOAD. THIS GATE IS FOR USE AGAINST THE ENDS (41" LENGTH) OF THE PALLETIZED UNIT IN A LOAD SUCH AS SHOWN ON PAGE 8.



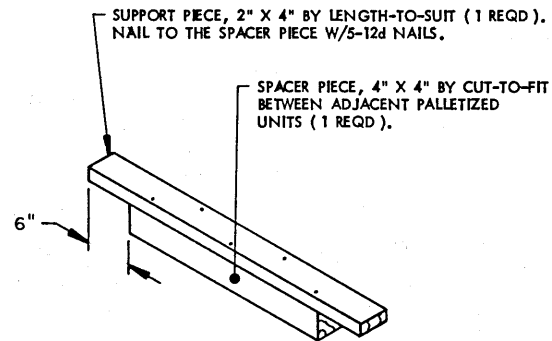
**DOORWAY PROTECTION GATE**

THE GATE SHOWN ABOVE IS FOR A THREE UNIT HIGH LOAD. DIMENSIONS ARE ALSO GIVEN FOR A TWO OR ONE UNIT HIGH LOAD. THIS METHOD IS FOR USE IN CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS WHEN THE DOOR POSTS ARE WOODEN, OR ARE STEEL AND HAVE HOLES IN WHICH TO ACCOMPLISH THE NAILING OF THE VERTICAL PIECES. **NOTE:** IF THE DOOR POSTS ARE NOT AVAILABLE, USE DOORWAY PROTECTION STRAPPING, AS SHOWN IN THE LOAD ON PAGES 8 AND 10, IN LIEU OF THE DOORWAY PROTECTION GATE.



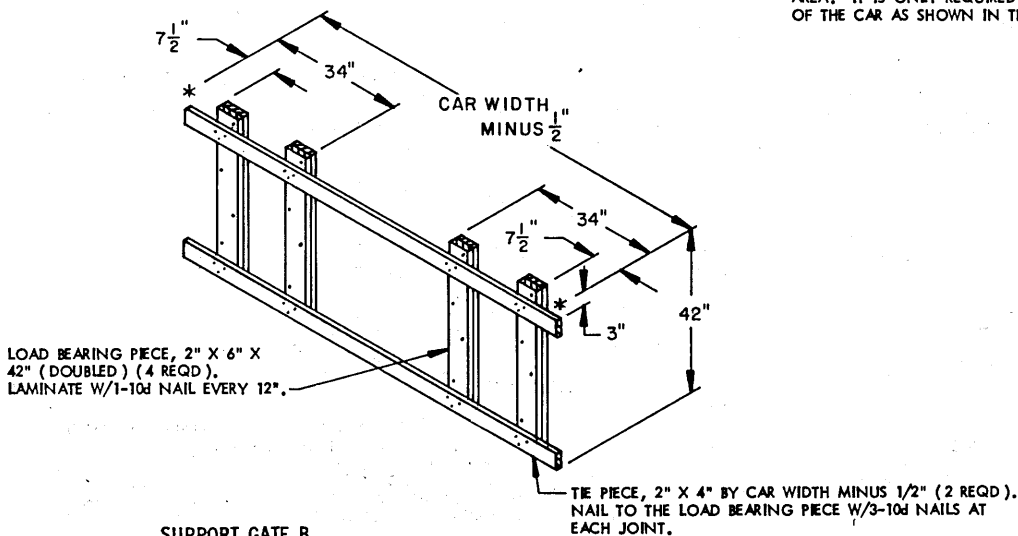
**SUPPORT GATE A**

THIS GATE IS ONLY FOR USE IN PARTIAL LOADS USING THE RISER METHOD OF BLOCKING, AS SHOWN ON PAGE 18.



**TOP-OF-LOAD ANTI-SWAY BRACE ASSEMBLY**

THIS ASSEMBLY IS FOR USE BETWEEN THE TOP OF LATERALLY ADJACENT PALLETIZED UNITS TO PREVENT UNITS FROM TOPPLING INTO THE VOID AREA. IT IS ONLY REQUIRED ON THE FIRST THREE STACKS AT EACH END OF THE CAR AS SHOWN IN THE LOAD ON PAGE 8.



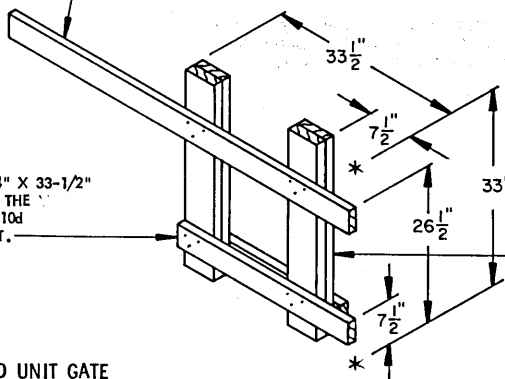
**SUPPORT GATE B**

THIS GATE IS ONLY FOR USE IN PARTIAL LOADS USING THE RISER METHOD OF BLOCKING, AS SHOWN ON PAGE 18.

SIDE BLOCKING/STRUT LEDGER, 2" X 6" BY CUT-TO-FIT BETWEEN PIECE MARKED ③ ON PAGE 20 AND THE CAR SIDE WALL (REF: 67-1/2" IN A 9'-2" WIDE CAR) (1 REQD). NAIL TO THE LOAD BEARING PIECE W/3-10d NAILS AT EACH JOINT.

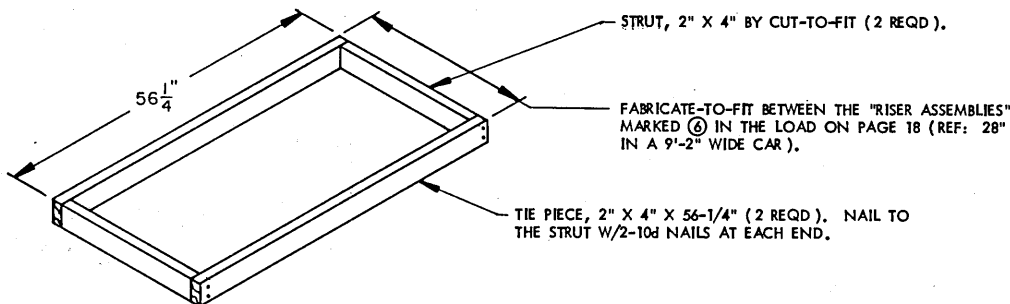
STRUT LEDGER, 2" X 4" X 33-1/2" (1 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

LOAD BEARING PIECE, 2" X 6" X 33" (DOUBLED) (2 REQD). LAMINATE W/5-10d NAILS.



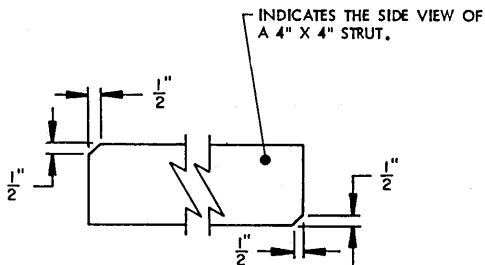
**OMITTED UNIT GATE**

THIS GATE IS FOR USE IN THE TOP LAYER OF A LOAD WHEN ONE PALLETIZED UNIT IS OMITTED AS SHOWN IN THE LOAD ON PAGE 20. NOTE: WHEN FABRICATING THIS GATE, ONE RIGHT HAND AND ONE LEFT HAND GATE WILL BE REQUIRED.



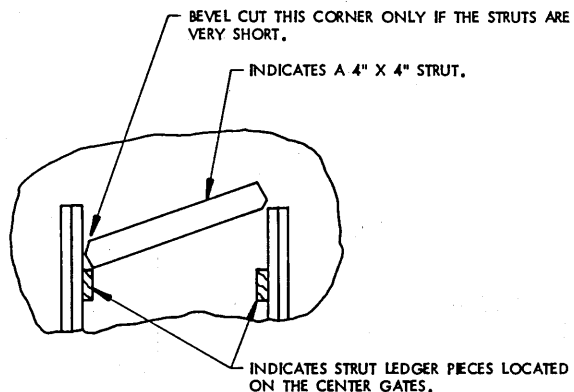
**RISER ASSEMBLY RETAINER**

THIS ASSEMBLY IS FOR USE BETWEEN RISER ASSEMBLIES AS SHOWN IN THE LOAD ON PAGE 18.



**BEVEL CUT**

BEVEL CUTTING THE STRUTS AS SPECIFIED ABOVE WILL FACILITATE INSTALLING THE STRUTS WITH A "DRIVE-FIT". CAUTION: DO NOT BEVEL A CORNER MORE THAN ONE-HALF INCH (1/2"). SEE GENERAL NOTE "W" ON PAGE 3 AND THE "STRUT INSTALLATION" ON THIS PAGE.



**STRUT INSTALLATION**

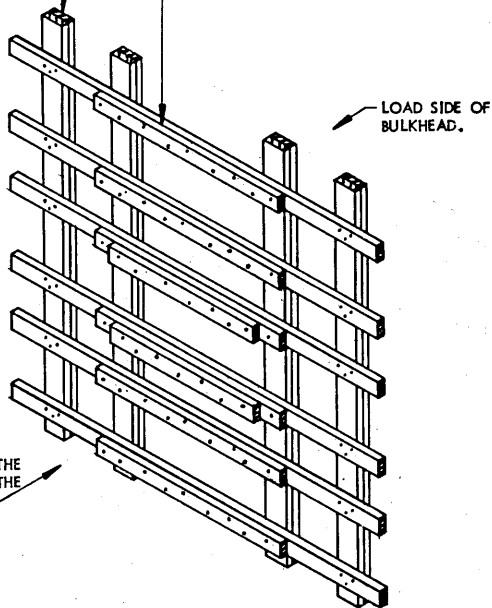
SEE THE "BEVEL CUT" DETAIL ON THIS PAGE AND GENERAL NOTE "W" ON PAGE 3 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.

CENTER GATE ASSEMBLY C  
(MODIFIED) (1 REQD).  
SEE THE DETAIL ON PAGE 28.

SHIM MATERIAL, 4" WIDE PLYWOOD OR  
DIMENSIONAL LUMBER OF A THICKNESS  
AND A LENGTH AS REQUIRED TO FILL  
THE VOID BETWEEN THE CAR END WALL  
AND THE BULKHEAD. NAIL TO A STRUT  
LEDGER PIECE AND/OR LAMINATE W/1-  
APPLICABLY SIZED NAIL EVERY 6".

**SPECIAL NOTES:**

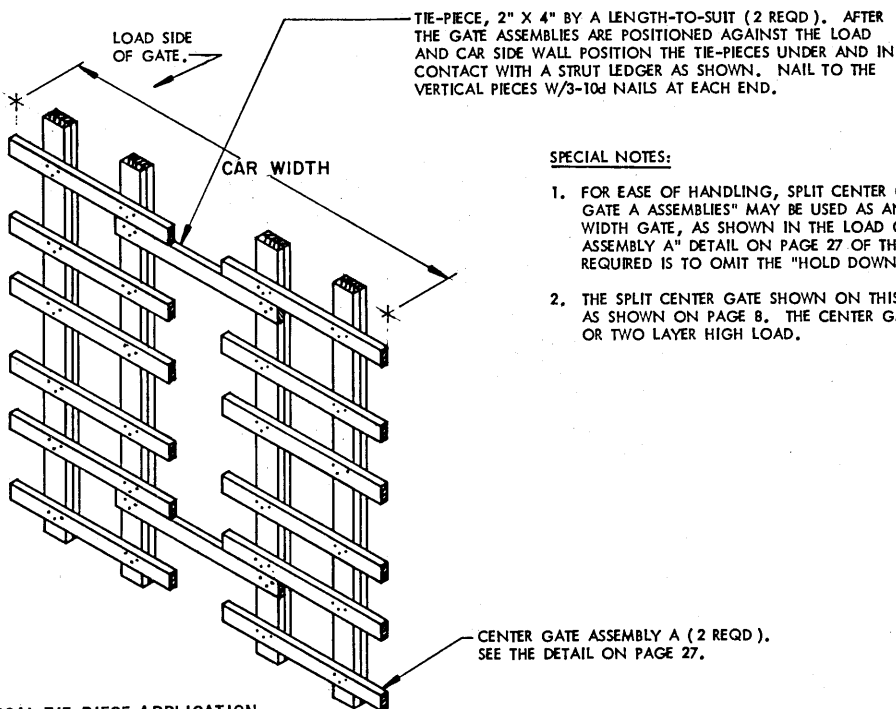
1. IF A BOX CAR TO BE LOADED HAS BOWED END WALLS WHICH ARE BOWED OUTWARD MORE THAN TWO INCHES (2"), EITHER FROM SIDE-TO-SIDE OR FROM FLOOR-TO-ROOF, AND END-OF-CAR BULKHEAD MUST BE INSTALLED TO PROVIDE A "SQUARED OFF" SURFACE FOR THE LOAD AT THE END OF THE CAR. THE BULKHEAD IS APPLICABLE FOR USE AT THE END OF A LOAD IN A CONVENTIONAL BOX CAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS.
2. THE BULKHEAD CONSISTS OF THE "CENTER GATE ASSEMBLY C" WHICH IS ALSO USED FOR BLOCKING AND BRACING THE COMPLETED LOAD, AS SHOWN ON PAGE 8. THIS GATE MUST BE MODIFIED FOR USE AT THE END OF THE CAR BY OMITTING THE "HOLD DOWN" PIECES AND ADDING "SHIM MATERIAL" AS SHOWN.
3. THE BULKHEAD SHOWN ON THIS PAGE IS FOR A THREE LAYER HIGH LOAD, AS SHOWN ON PAGE 8. THE CENTER GATE MAY ALSO BE MODIFIED FOR A ONE OR TWO LAYER HIGH LOAD. IF A BULKHEAD IS TO BE USED IN A COMBINATION LOAD, AS SHOWN ON PAGE 6, THE VERTICAL PIECES WHICH WILL BE AGAINST THE 56-3/8" WIDTH MUST BE POSITIONED 40" APART.



PLACE THIS SIDE OF THE  
BULKHEAD AGAINST THE  
CAR END WALL.

**BOWED END WALL PROVISIONS**

THIS BULKHEAD IS FOR USE BETWEEN THE LOAD AND THE CAR END WALL. IT IS TYPICAL ONLY, A MODIFIED "CENTER GATE ASSEMBLY C" IS SHOWN. SEE THE DETAIL ON PAGE 28 AND THE SPECIAL NOTES ON THIS PAGE.



TIE-PIECE, 2" X 4" BY A LENGTH-TO-SUIT (2 REQD). AFTER THE GATE ASSEMBLIES ARE POSITIONED AGAINST THE LOAD AND CAR SIDE WALL POSITION THE TIE-PIECES UNDER AND IN CONTACT WITH A STRUT LEDGER AS SHOWN. NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH END.

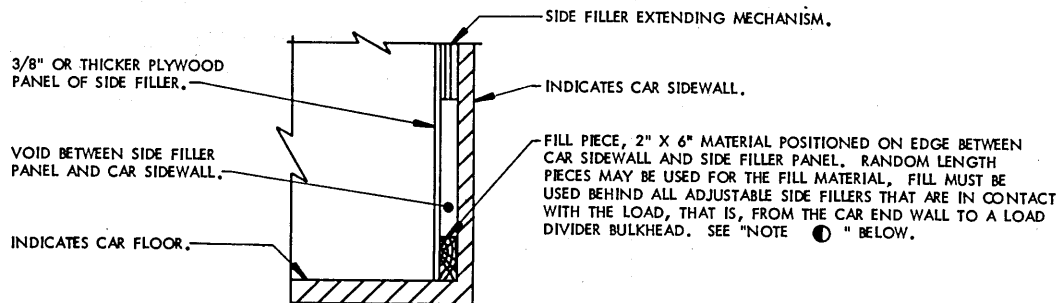
**SPECIAL NOTES:**

1. FOR EASE OF HANDLING, SPLIT CENTER GATES FABRICATED FROM TWO "CENTER GATE A ASSEMBLIES" MAY BE USED AS AN ALTERNATIVE IN LIEU OF A FULL CAR WIDTH GATE, AS SHOWN IN THE LOAD ON PAGE 8. SEE THE "CENTER GATE ASSEMBLY A" DETAIL ON PAGE 27 OF THIS DRAWING. THE ONLY MODIFICATION REQUIRED IS TO OMIT THE "HOLD DOWN" PIECES ON THE GATE ASSEMBLY.
2. THE SPLIT CENTER GATE SHOWN ON THIS PAGE IS FOR A THREE LAYER HIGH LOAD, AS SHOWN ON PAGE 8. THE CENTER GATE MAY ALSO BE MODIFIED FOR A ONE OR TWO LAYER HIGH LOAD.

**TYPICAL TIE-PIECE APPLICATION  
FOR SPLIT CENTER GATES**

THE SPLIT CENTER GATE SHOWN ABOVE MAY BE USED IN LIEU OF THE "CENTER GATE ASSEMBLY C" SHOWN IN THE LOAD ON PAGE 8. SEE THE SPECIAL NOTES ON THIS PAGE.

CENTER GATE ASSEMBLY A (2 REQD).  
SEE THE DETAIL ON PAGE 27.

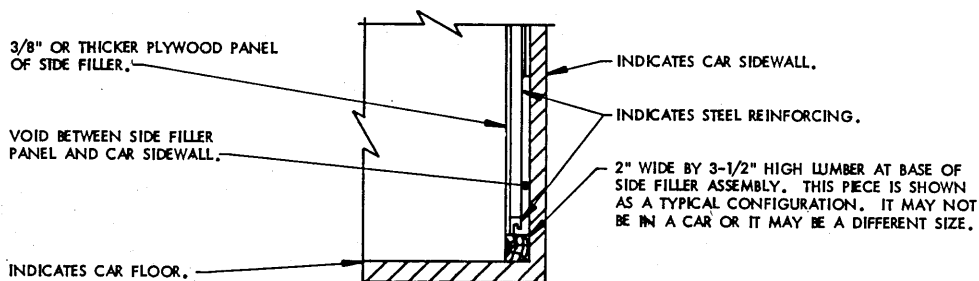


**TYPICAL TYPE A**

THIS VIEW SHOWS THE INSTALLATION OF A "FILL PIECE" IN A CAR EQUIPPED WITH A STANDARD ADJUSTABLE SIDE FILLER. SEE GENERAL NOTE "AA" ON PAGE 3.

**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. SEE GENERAL NOTE "AA" ON PAGE 3.