

APPROVED BY
 HAZARDOUS MATERIALS SYSTEMS
 (BOE) ASSOCIATION OF AMERICAN
 RAILROADS
J. H. Robinson
 DATE 4/4/88

LOADING AND BRACING (CL & LCL) IN BOX CARS OF 40MM CARTRIDGES PACKED 192 PER PA105 4-WAY ENTRY METAL SHIPPING AND STORAGE CONTAINER UNITIZED TWO CONTAINERS PER UNIT LOAD

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

DO NOT SCALE

REVISIONS			DRAFTSMAN 88 RP/dh	PROJ ENG LAF/WRF
			CHECKER WRF	LOG ENGR OFFICE WRF
			APPROVED, U.S. ARMY ARMAMENT, MUNITIONS AND CHEMICAL COMMAND <i>J. A. Byrd</i>	
			APPROVED BY ORDER OF COMMANDING GENERAL, U.S. ARMY MATERIALS COMMAND (AMC) <i>William A. Ernst</i> U.S. ARMY DEFENSE AMMUNITION CENTER AND SCHOOL	
			U.S. ARMY AMC DRAWING	
			JUNE 1988	
			CLASS	DIVISION
			19	48
			DRAWING	FILE
			4216	5PM 1010

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 40MM CARTRIDGES PACKED IN PA105 SHIPPING AND STORAGE CONTAINERS, UNITIZED. SEE THE PICTORIAL VIEW ON PAGE 43. REFER TO THE U.S. ARMY AMC DRAWING 19-48-4186-20PM 1005 FOR UNITIZATION PROCEDURES FOR THE PA105 CONTAINER.
- C. THE OUTLOADING PROCEDURES DEPICTED WITHIN THIS DOCUMENT ARE APPLICABLE FOR SHIPMENTS IN CONVENTIONAL TYPE BOXCARS, FOR SHIPMENTS IN BOXCARS EQUIPPED WITH VARIOUS TYPES OF SELF-CONTAINED MECHANICAL BRACING DEVICES, AND FOR SHIPMENTS IN CUSHIONED BOXCARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.
- D. THE SELECTION OF RAILCARS FOR THE TRANSPORT OF UNITIZED LOADS 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.
- E. WHEN SELECTING RAILCARS, EVERY EFFORT SHOULD BE MADE TO OBTAIN BOXCARS THAT DO NOT HAVE BOWED ENDWALLS. CARS HAVING BOWED ENDS CAN BE USED, HOWEVER, IF AN ENDWALL IS BOWED OUTWARD MORE THAN 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 35 FOR GUIDANCE.
- F. BOXCARS 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 SEAL USED TO SEAL THE CAR. THE WIRE WILL BE THREADED THRU THE SLOT HOLES IN THE DOOR LATCH ASSEMBLY ONE OR MORE TIMES, AND THE WIRE ENDS WILL BE TWISTED TOGETHER.
- G. 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.
- H. OTHER TYPES OF LADING ITEMS MAY BE LOADED IN CARS WHICH ARE PARTIALLY LOADED WITH UNITIZED LOADS OF 40MM CARTRIDGES, 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.
- J. 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".

(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	CLASS 1, TYPE I OR IV, HEAVY DUTY, FINISH A, B (GRADE 2) OR C; FED SPEC QQ-5-781.
STRAP SEAL	TYPE D, STYLE I, II, OR IV, CLASS H, FINISH A, B (GRADE 2) OR C; FED SPEC QQ-5-781.
PLYWOOD	FED SPEC NN-P-530; GROUP B, CONSTRUCTION AND INDUSTRIAL PLYWOOD, INTERIOR WITH EXTERIOR GLUE, GRADE C-D. IF SPECIFIED GRADE IS NOT AVAILABLE, A BETTER INTERIOR OR AN EXTERIOR GRADE MAY BE USED.
WIRE	FED SPEC QQ-W-461.

(GENERAL NOTES CONTINUED)

- K. **NOTICE:** A STAGGERED NAILING PATTERN WILL BE USED WHEREVER POSSIBLE WHEN NAILS ARE DRIVEN INTO JOINTS OF DUNNAGE ASSEMBLIES. ALSO, A STAGGERED NAILING PATTERN WILL BE USED WHEN DUNNAGE IS NAILED TO THE FLOOR OR SIDEWALL OF THE TRANSPORTING VEHICLE, OR WHEN LAMINATING DUNNAGE. THE NAILING PATTERN WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL DOES NOT PENETRATE INTO OR NEAR A CRACK BETWEEN FLOOR BOARDS OR SIDEWALL BOARDS. ADDITIONALLY, THE NAILING PATTERN FOR AN UPPER PIECE OF LAMINATED DUNNAGE WILL BE ADJUSTED AS REQUIRED SO THAT A NAIL FOR THAT PIECE WILL NOT BE DRIVEN THROUGH ONTO OR RIGHT BESIDE A NAIL IN A LOWER PIECE.
- L. WHEN STEEL STRAPPING IS SEALED AT AN END-OVER-END LAP JOINT, A MINIMUM OF ONE SEAL WITH TWO PAIR OF NOTCHES WILL BE USED TO SEAL THE JOINT WHEN A NOTCH-TYPE SEALER IS BEING USED. A MINIMUM OF TWO SEALS, BUTTED TOGETHER, WITH TWO 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 43 FOR GUIDANCE.
- M. 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.
- N. THE NUMBER OF LADING UNITS MAY BE ADJUSTED TO FIT THE SIZE OF THE BOXCAR 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 RAILCAR IN COMPLIANCE WITH THE WEIGHT DISTRIBUTION REQUIREMENTS OF THE AAR.

GENERAL NOTES

(FOR CONVENTIONAL TYPE BOXCARS)

- O. IF THE CAR BEING USED FOR 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 "K" ABOVE.
- P. **NOTICE:** WHEN POSITIONING UNIT LOADS 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 UNIT LOADS 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 UNIT LOADS, SUCH AS THE WOODEN DUNNAGE USED ON THE UNIT LOADS. PADDING, OF 2" THICK LUMBER OR ANY OTHER MATERIAL OF SIMILAR CONSISTENCY, SHOULD BE PLACED BETWEEN THE JACK AND THE LADING.
- Q. 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 15. 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 UNDERSIDE OF THOSE STRUTS.
- R. 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 35 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.
- S. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

(CONTINUED ON PAGE 3)

GENERAL NOTES

(FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES)

- T. THE OUTLOADING PROCEDURES FOR BOXCARS EQUIPPED WITH MECHANICAL BRACING DEVICES MAY BE ADAPTED AS REQUIRED TO FACILITATE THE USE OF BOXCARS 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:** BOXCARS EQUIPPED WITH MEMBERS WHICH DO NOT MEET THE LOCATION REQUIREMENTS MUST NOT BE USED.
1. FOR BLOCKING THE LOADS WHICH ARE DEPICTED, A CROSS MEMBER WILL NOT BE RELIED UPON TO RETAIN MORE LADING ON EITHER SIDE THAN AS SHOWN. VOIDS LENGTHWISE WITHIN THE LOAD MUST BE HELD TO A MINIMUM AND CROSS MEMBERS MUST BE PLACED AGAINST THE LADING AS TIGHTLY AS THE SPACING OF THE LOCKING HOLES IN THE WALL MEMBERS PERMIT. LOCKING BARS (LEVER JACKS) SHOULD BE USED FOR THIS PURPOSES. AN ADDITIONAL 1/2" OF ADJUSTMENT CAN BE MADE BY TURNING A CROSS MEMBER END-FOR-END WHEN LOCKING PINS ON THE MEMBER ARE OFF-CENTER. **NOTE:** IT IS RECOMMENDED THAT EACH CROSS MEMBER BE INSTALLED WITH THE ENDS ATTACHED AS NEARLY AS POSSIBLE IN "MATED" POSITIONS (AT EQUAL HEIGHTS AND AT EQUAL DISTANCES FROM THE END OF THE CAR).
 2. **CAUTION:** ALL BLOCKING AND BRACING COMPONENTS IN EMPTY CARS AND ALL UNUSED COMPONENTS IN LOADED CARS MUST BE "SECURED" FOR SHIPMENT - ADJUSTABLE WALL MEMBERS TO VERTICAL WALL ATTACHMENT RAILS, AND CROSS MEMBERS TO ADJUSTABLE WALL MEMBERS OR TO FIXED HORIZONTAL WALL MEMBERS OR TO DOORWAY MEMBERS, AND DOORWAY MEMBERS TO DOOR POSTS. COMPONENTS ASSIGNED TO EACH CAR MUST REMAIN THEREWITH EVEN THOUGH UNUSED DURING SOME SHIPMENTS.
- U. 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.
- V. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.

GENERAL NOTES

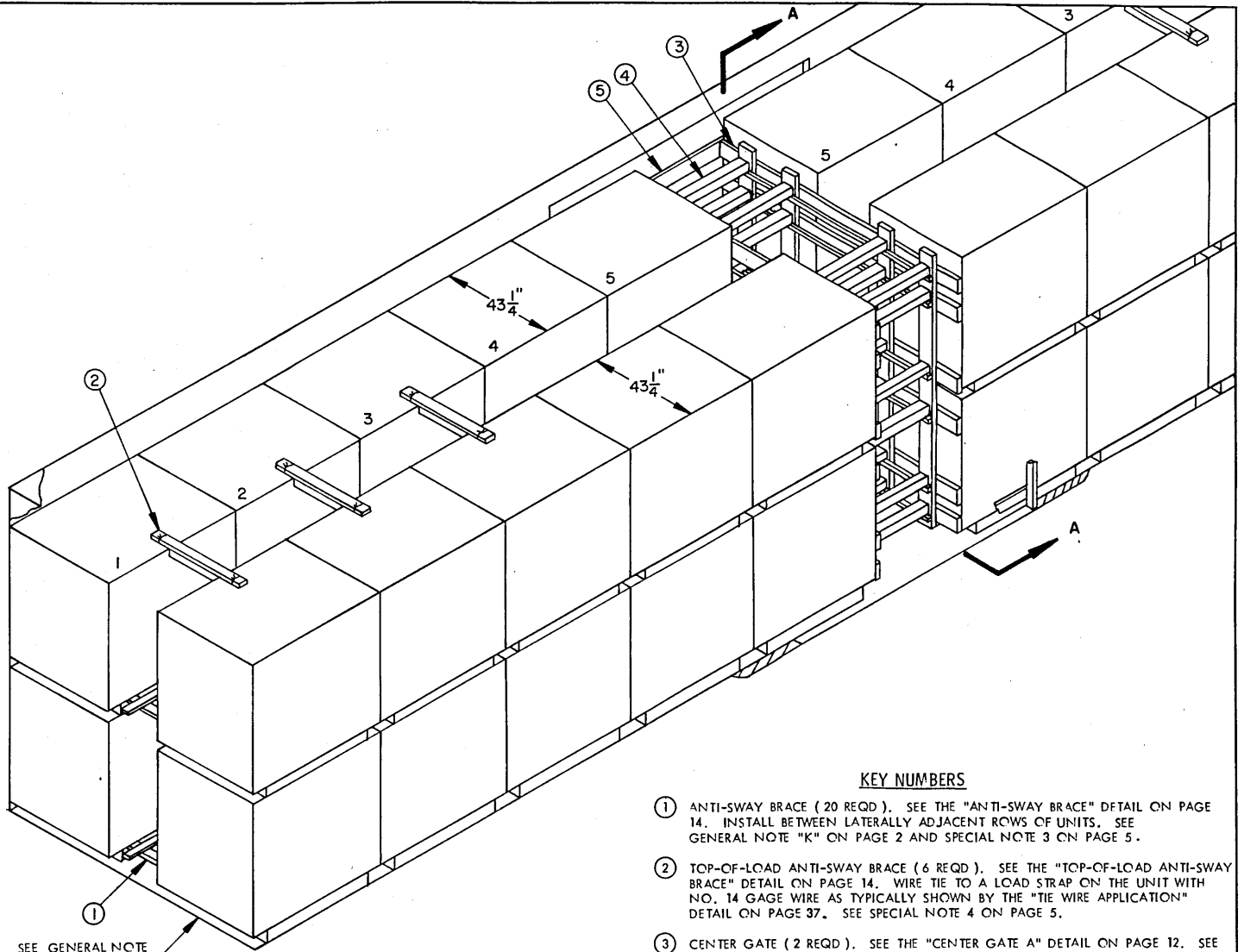
(FOR CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS)

- AA. **CAUTION:** FOR CUSHIONED BOXCARS 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 BOXCAR LOADS. THIS WILL ACCOUNT FOR A CONSIDERABLE SAVINGS IN MATERIAL AND LABOR COSTS. THEREFORE, EVERY EFFORT SHOULD BE MADE TO ACQUIRE CUSHIONED CARS EQUIPPED WITH LOAD DIVIDERS FOR SHIPMENT OF 40MM CARTRIDGES IN P4105 CONTAINERS. **NOTICE:** ONLY CUSHIONED CARS THAT HAVE SLIDING CENTER SILL TYPE CUSHIONING DEVICES OR END-OF-CAR TYPE DEVICES WHICH HAVE AT LEAST 15" OF TRAVEL ARE ACCEPTABLE.
- CC. IF NAILING TO A CAR SIDEWALL IS NOT REQUIRED, BOXCARS 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 42 FOR GUIDANCE. IF THE BACK OF THE SIDE FILLER PANELS ARE REINFORCED WITH VERTICAL AND HORIZONTAL STEEL MEMBERS AS SHOWN IN THE "TYPICAL VIEW B" ON PAGE 42, THE "FILL PIECE" MATERIAL IS NOT REQUIRED.
- 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 CLASS A OR CLASS B EXPLOSIVES AND THE LOAD IN EITHER END OF THE CAR WEIGHS 50,000 POUNDS OR MORE. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES. NOTE THAT THE STRUT ASSEMBLY MAY BE OMITTED FROM LOADS OF CLASS A OR CLASS B EXPLOSIVES WEIGHING 50,000 POUNDS WHEN THE LADING AND ADEQUATE BLOCKING AND BRACING ARE POSITIONED TO COMPLETELY FILL THE SPACE BETWEEN THE INSTALLED BULKHEADS AS SPECIFIED IN GENERAL NOTE "FF-3" AT RIGHT. DETAILS OF STRUT ASSEMBLIES FOR USE BETWEEN 2-PIECE BULKHEADS AND BETWEEN 1-PIECE BULKHEADS ARE SHOWN ON PAGE 41.

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(GENERAL NOTES CONTINUED)

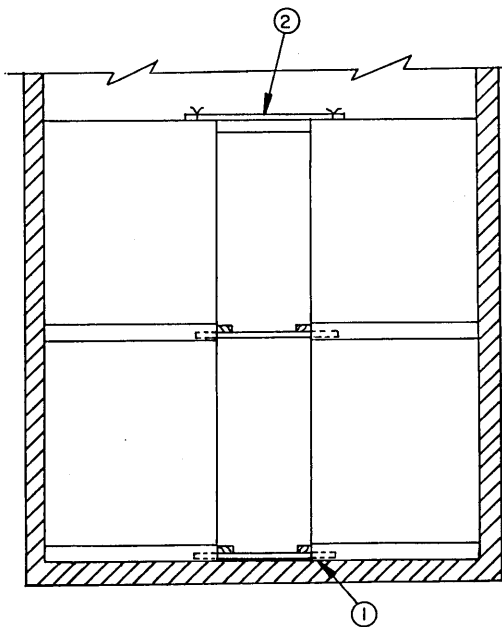
- FF. THE NORMAL LOADING PATTERN IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS IS TO POSITION THE LADING BETWEEN A CAR ENDWALL AND A LOAD DIVIDER BULKHEAD IN FULL LAYERS. OBVIOUSLY, A LOAD QUANTITY MUST THEN BE A MULTIPLE OF THE NUMBER OF UNIT LOADS WHICH ARE IN ONE LOAD UNIT. A LOAD UNIT IS DEFINED AS A STACK OF UNIT LOADS 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 THE 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.
1. ONE OR MORE RISERS CAN BE POSITIONED WITHIN A LOAD TO INCREASE A LOAD QUANTITY. SEE THE RISER PROCEDURES AND DETAILS ON PAGES 20 AND 21.
 2. THE "GATES AND STRUTS" METHOD OF OMITTING A UNIT LOAD MAY BE USED TO ADJUST A LOAD QUANTITY DOWNWARD BY OTHER THAN A MULTIPLE OF A LOAD UNIT. SEE THE PROCEDURES ON PAGE 15 FOR GUIDANCE.
 3. AT LOCATION (S) WHERE K-BRACES MIGHT NORMALLY BE USED IN A LOAD IN A CONVENTIONAL CAR, LOAD DIVIDER BULKHEADS CAN BE POSITIONED. LOADING CAN THEN CONTINUE TOWARD THE CENTER OF THE CAR FROM EACH INSTALLED LOAD DIVIDER BULKHEAD, IN EVEN LAYERS WHICH ARE ONE OR MORE LESS IN HEIGHT THAN THE LOAD IN THE ENDS OF THE CAR. INSTALL CENTER GATES, STRUTS AND GATE HOLD DOWNS AS SHOWN IN THE APPLICABLE CONVENTIONAL BOXCAR DRAWING HEREIN, TO PROVIDE FOR A TIGHT LOAD BETWEEN THE BULKHEADS.
 4. ONE OR MORE UNITS CAN BE POSITIONED IN CONTACT WITH A LOAD DIVIDER BULKHEAD ON THE CENTER-OF-CAR SIDE. BLOCK AND BRACE WITH LCL BRACES AS SHOWN ON PAGE 32, OR WITH KNEE BRACE ASSEMBLIES, AS SHOWN ON PAGE 28.
- GG. FOR ADDITIONAL GUIDANCE, ATTENTION IS DIRECTED TO THE "SPECIAL NOTES" SECTIONS WHICH ARE IMMEDIATELY ADJACENT TO THE DEPICTED OUTLOADING METHODS.



ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 5.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 5.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12. SEE SPECIAL NOTE 5 ON PAGE 5.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 32") (24 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J", "Q" AND "R" ON PAGE 2.
- ⑤ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 12. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTES 6 AND 7 ON PAGE 5.



SECTION A-A

40-UNIT LOAD IN A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL BOXCAR

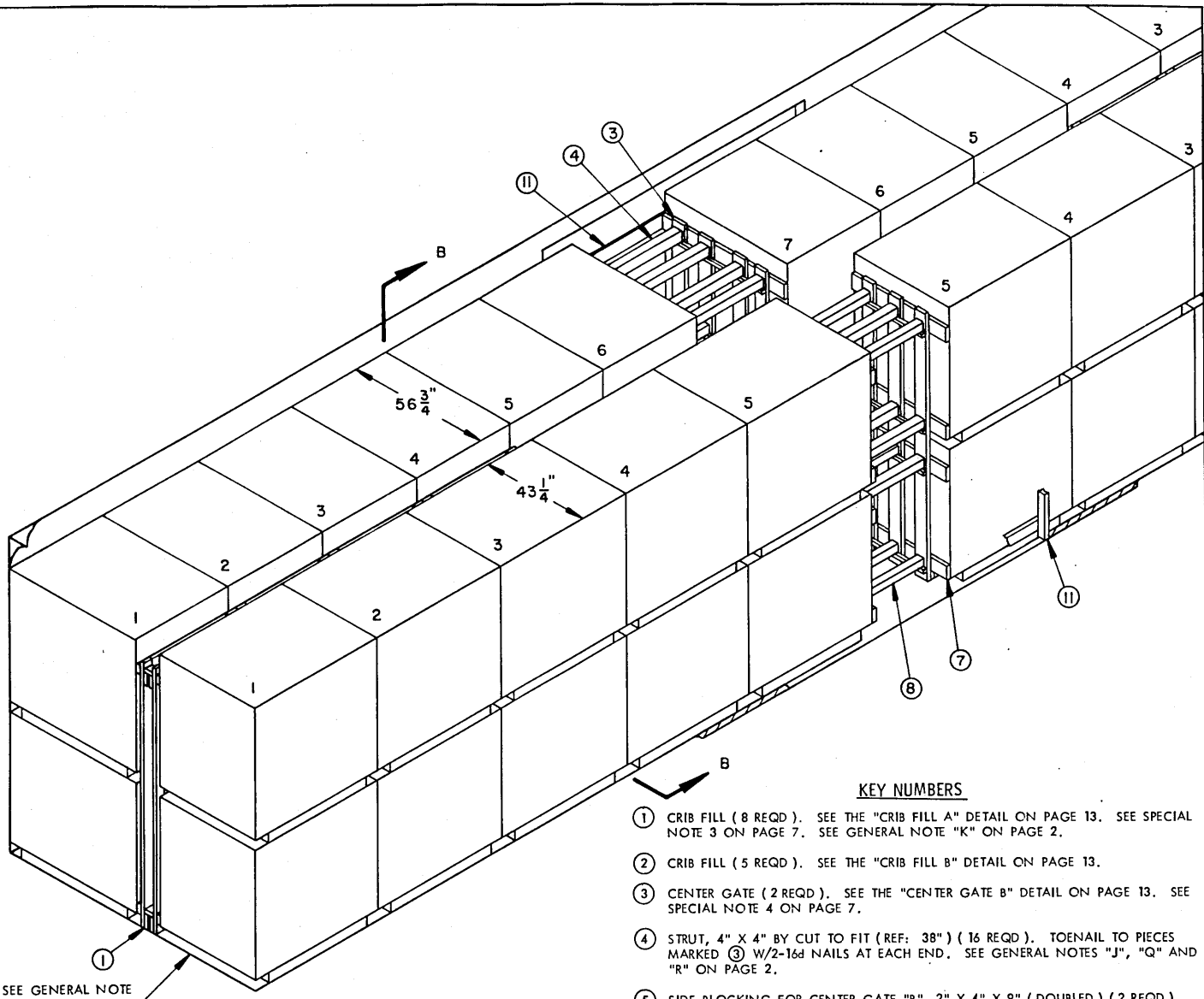
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR 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. A MAXIMUM OF THIRTY-TWO (32) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 102,496 POUNDS, CAN BE PLACED IN A 40'-6" LONG CAR WHEN USING THE DEPICTED PROCEDURES: FORTY-EIGHT (48) UNITS, FOR A LADING WEIGHT OF 153,744 POUNDS, CAN BE OUTLOADED IN A 60'-8" LONG CAR.
3. IF THE "ALTERNATIVE DOORWAY PROTECTION F" PROCEDURES AS SHOWN ON PAGE 40 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (5), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACE IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL 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 ON EITHER SIDE OF THE CAR.
4. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED (2) IN THE LOAD ON PAGE 4 MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A LOAD STRAP WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. CENTER GATE "A" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 36 FOR GUIDANCE.
6. DOORWAY PROTECTION IS REQUIRED FOR ALL UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (5) IN THE LOAD ON PAGE 4 IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION F" DETAIL ON PAGE 40 FOR GUIDANCE. SEE SPECIAL NOTE 7.
7. IF THE ALTERNATIVE DOORWAY PROTECTION "F" PROCEDURES SHOWN ON PAGE 40 ARE USED IN LIEU OF THE WOODEN DOORWAY PROTECTION, PIECE MARKED (5), THE CENTER GATES MUST BE RESTRAINED FROM LATERAL MOVEMENT. THIS CAN BE ACCOMPLISHED BY NAILING TO THE CAR FLOOR A DOUBLED 2" X 4" X 18" PIECE POSITIONED LONGITUDINALLY SO AS TO BE CENTERED AGAINST THE FILL PIECE OF A CENTER GATE. TWO (2) PIECES WILL BE REQUIRED FOR EACH CENTER GATE WHICH IS IN THE DOOR OPENING OR WITHIN SIX INCHES (6") OF BEING IN THE DOOR OPENING.
8. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 15 THRU 34 FOR GUIDANCE.
9. DOOR SPANNER TYPE GATE HOLD DOWN MAY BE USED IN LIEU OF THE DOUBLED 2" X 4" MATERIAL NAILED TO CENTER GATE "A", PROVIDING THE CAR HAS NAILABLE SIDEWALLS. SEE THE DETAILS ON PAGE 38 FOR GUIDANCE.
10. FOR SHIPMENT OF ONE LEFTOVER CONTAINER, REFER TO PAGES 33 AND 34 FOR GUIDANCE.

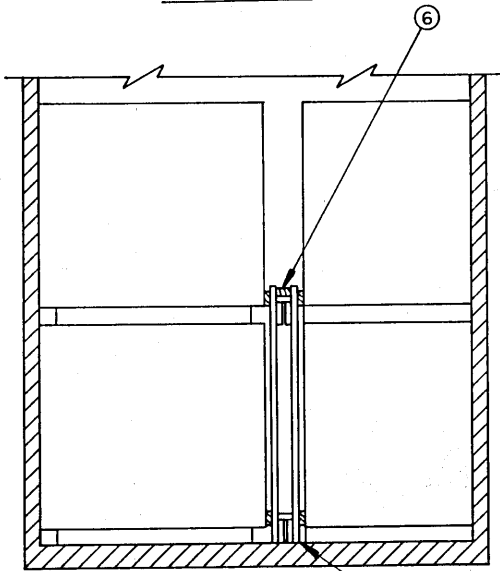
BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
2" X 2"	92	31
2" X 3"	35	18
2" X 4"	379	253
2" X 6"	182	182
4" X 4"	64	85
NAILS	NO. REQD	POUNDS
6d (2")	48	1/4
10d (3")	520	8
12d (3-1/4")	50	3/4
16d (3-1/2")	96	2-1/4
WIRE, NO. 14 GAGE -----36' REQD ----- 1/2 LB		

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT -----	40 -----	128, 120 LBS
DUNNAGE -----		1,230 LBS
TOTAL WEIGHT -----		129,350 LBS



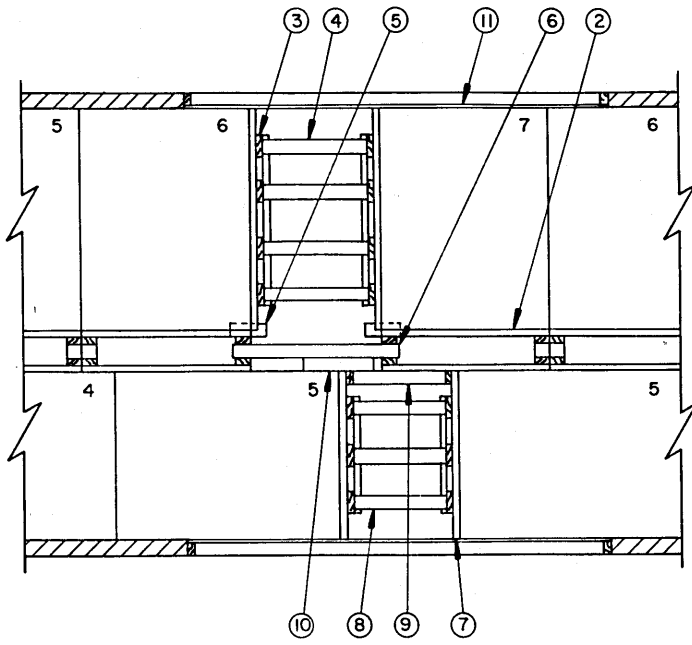
ISOMETRIC VIEW



SECTION B-B

KEY NUMBERS

- ① CRIB FILL (8 REQD). SEE THE "CRIB FILL A" DETAIL ON PAGE 13. SEE SPECIAL NOTE 3 ON PAGE 7. SEE GENERAL NOTE "K" ON PAGE 2.
- ② CRIB FILL (5 REQD). SEE THE "CRIB FILL B" DETAIL ON PAGE 13.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE B" DETAIL ON PAGE 13. SEE SPECIAL NOTE 4 ON PAGE 7.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 38") (16 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J", "Q" AND "R" ON PAGE 2.
- ⑤ SIDE BLOCKING FOR CENTER GATE "B", 2" X 4" X 9" (DOUBLED) (2 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/4-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "PARTIAL PLAN VIEW" ON PAGE 7.
- ⑥ CRIB FILL RETAINER, 2" X 4" BY A LENGTH TO SUIT (REF: 56") (2 REQD). POSITION TO SPAN THE STRUTS OF LONGITUDINALLY ADJACENT CRIB FILL "B" ASSEMBLIES AND NAIL TO EACH STRUT W/3-10d NAILS. SEE THE "PARTIAL PLAN VIEW" ON PAGE 7.
- ⑦ CENTER GATE (2 REQD). SEE THE "CENTER GATE C" DETAIL ON PAGE 14. SEE SPECIAL NOTE 4 ON PAGE 7.
- ⑧ STRUT, 4" X 4" BY CUT TO FIT (REF: 32") (12 REQD). TOENAIL TO PIECES MARKED ⑦ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "J", "Q" AND "R" ON PAGE 2.
- ⑨ STRUT, 2" X 4" BY CUT TO FIT (REF: 32") (2 REQD). TOENAIL TO THE STOP PIECES OF PIECE MARKED ⑦ W/2-12d NAILS AT EACH END. SEE THE "PARTIAL PLAN VIEW" ON PAGE 7. SEE GENERAL NOTES "Q" AND "R" ON PAGE 2.
- ⑩ SIDE BLOCKING FOR CENTER GATE "C", 2" X 4" X 18" (DOUBLED) (1 REQD). NAIL THE FIRST PIECE TO THE CAR FLOOR W/2-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. SEE THE "PARTIAL PLAN VIEW" ON PAGE 7.
- ⑪ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 12. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 5 ON PAGE 7.



PARTIAL PLAN VIEW

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR 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. A MAXIMUM OF FIFTY-SIX (56) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 179,368 POUNDS, CAN BE PLACED IN A HI-CAPACITY 60'-8" LONG CAR WHEN USING THE DEPICTED PROCEDURES.
3. THE "HIGH" CRIB, SHOWN AS PIECE MARKED ①, MUST BE INSTALLED IN EACH END OF THE LOAD. FOUR (4) ASSEMBLIES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
4. CENTER GATES "B" AND "C" MAY BE PARTIALLY FORMED FROM 1/2" OR THICKER PLYWOOD, IF DESIRED. PLYWOOD MAY BE USED IN LIEU OF THE 2" X 6" HORIZONTAL PIECES. SEE THE "PLYWOOD CENTER GATE ALTERNATIVE" DETAIL ON PAGE 36 FOR GUIDANCE.
5. DOORWAY PROTECTION IS REQUIRED FOR ALL PALLET UNIT STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTENDS INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH OR LENGTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED ① IN THE LOAD ON PAGE 6, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 38 THRU 40 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOOR-LINE BLOCKING AND LOAD-BUNDLING STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION F" DETAIL ON PAGE 40 FOR GUIDANCE.
6. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY ONE OR MORE PALLET UNITS BY EMPLOYING THE PROCEDURES ON PAGE 18. FOUR (4) UNITS CAN BE OMITTED FROM A 2-TIER LOAD BY LEAVING OUT THE LENGTHWISE STACKS NO. 5 AND THE CROSSWISE STACK NO. 7. NOTE THAT STRUT BRACING WILL THEN BE REQUIRED. OR, THE ENTIRE TOP TIER CAN BE OMITTED. A PARTIAL 1-TIER LOAD CAN BE SHIPPED IN ONE OR BOTH ENDS OF A CAR BY USING KNEE BRACES AS SHOWN ON PAGES 28 AND 29.
7. FOR SHIPMENT OF ONE LEFTOVER CONTAINER, REFER TO PAGES 33 AND 34 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	40	80
2" X 2"	49	16
2" X 3"	35	18
2" X 4"	701	468
2" X 6"	193	193
4" X 4"	83	110
NAILS	NO. REQD	POUNDS
6d (2")	48	1/4
10d (3")	1,108	17
12d (3-1/4")	28	1/2
16d (3-1/2")	132	2-3/4

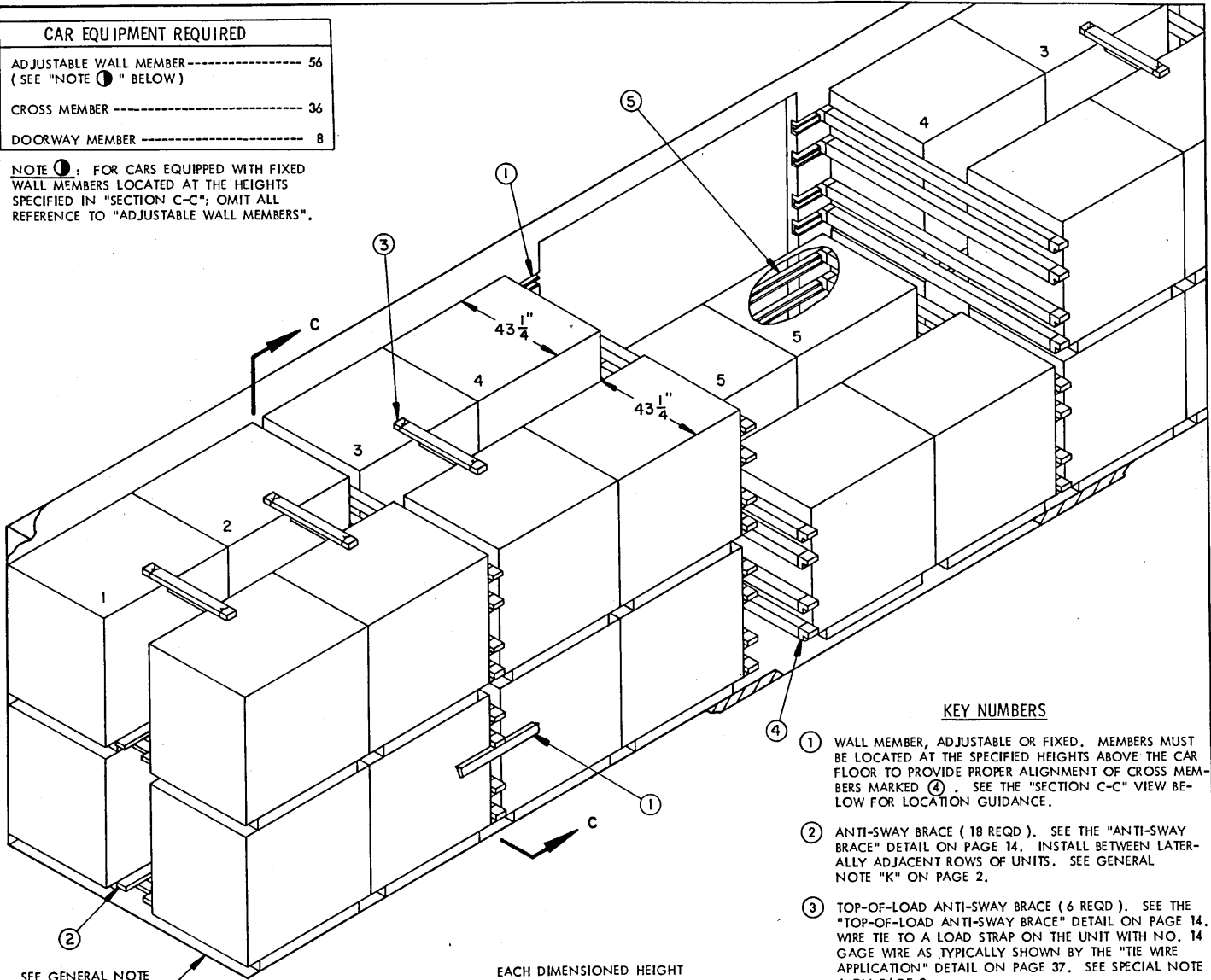
LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	46	147,338 LBS
DUNNAGE		1,791 LBS
TOTAL WEIGHT		149,129 LBS

CAR EQUIPMENT REQUIRED

ADJUSTABLE WALL MEMBER-----	56
(SEE "NOTE 1" BELOW)	
CROSS MEMBER-----	36
DOORWAY MEMBER-----	8

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



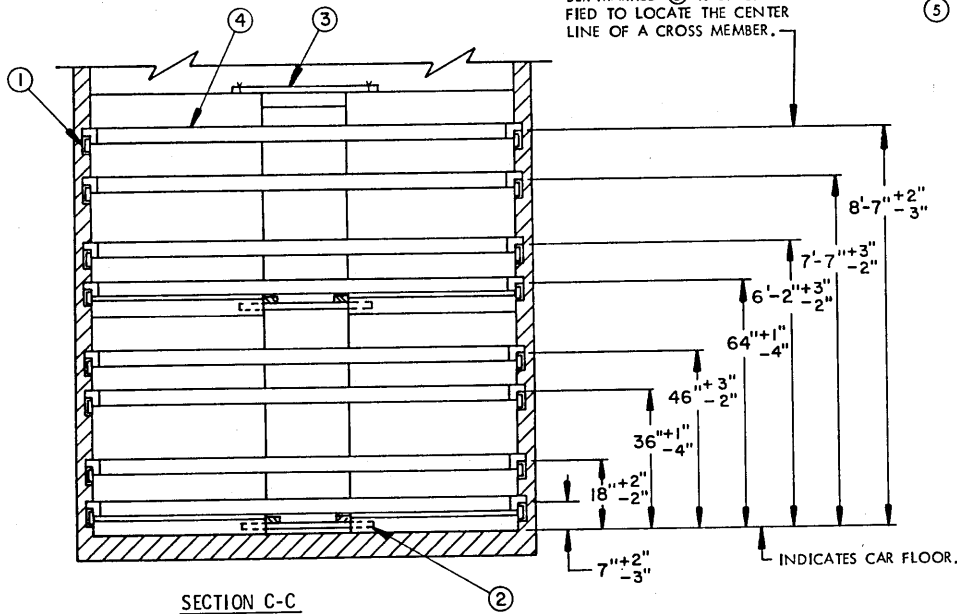
SEE GENERAL NOTE "E" ON PAGE 2.

ISOMETRIC VIEW

EACH DIMENSIONED HEIGHT ABOVE THE CAR FLOOR TO AN ADJUSTABLE OR FIXED WALL MEMBER MARKED 1 AND/OR A DOORWAY MEMBER MARKED 5 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 C-C" VIEW BELOW FOR LOCATION GUIDANCE.
- 2 ANTI-SWAY BRACE (18 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2.
- 3 TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 9.
- 4 CROSS MEMBER (36 REQD). SEE GENERAL NOTE "I" ON PAGE 3.
- 5 DOORWAY MEMBER (8 REQD). SEE THE "SECTION C-C" VIEW BELOW FOR LOCATION GUIDANCE. SEE SPECIAL NOTE "7" ON PAGE 9.



SECTION C-C

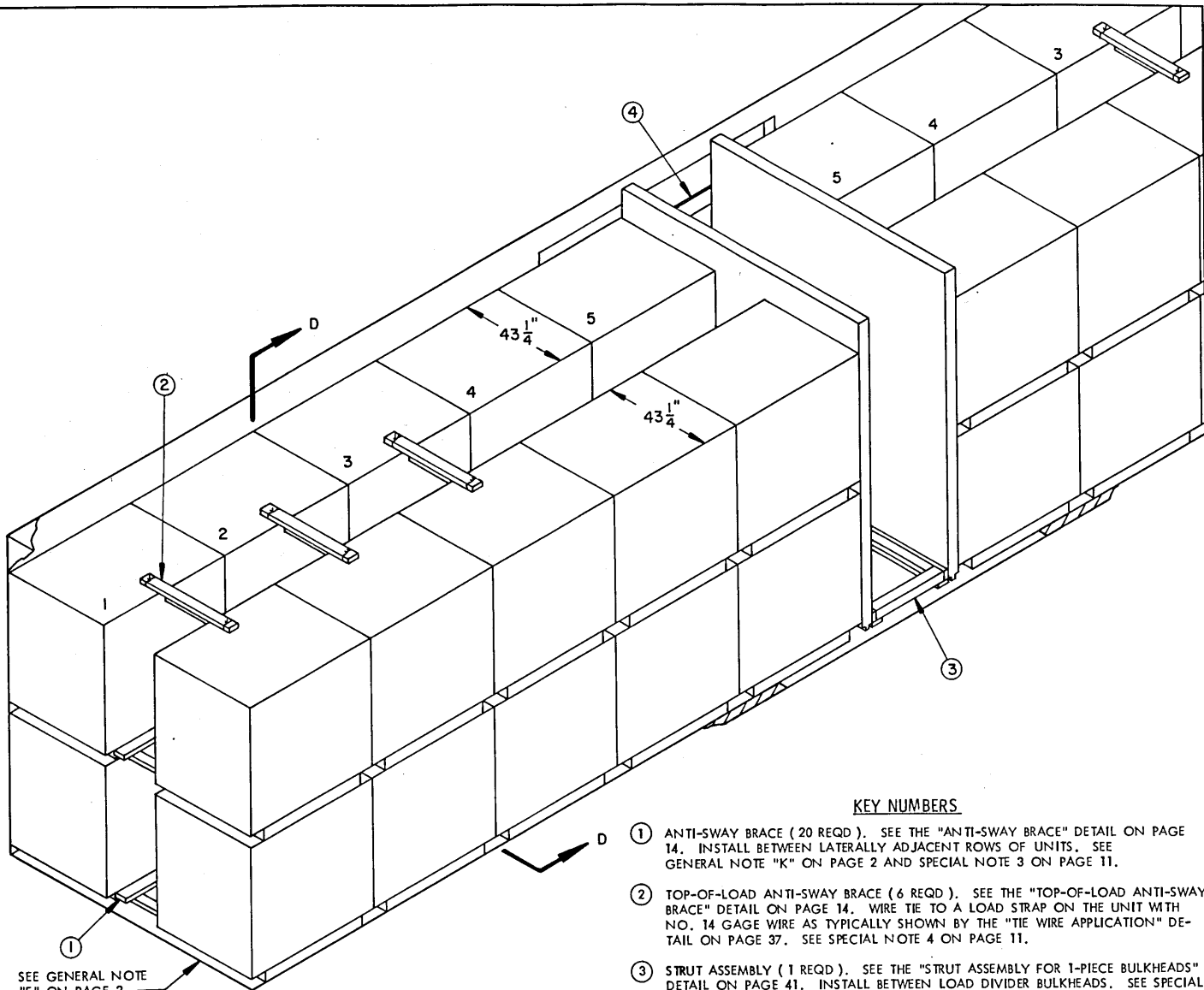
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOXCAR 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. A MAXIMUM OF TWENTY-EIGHT (28) OF THE PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 89,684 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 ENDWALL OF THE CAR TO PROVIDE A "SQUARED-END" RATHER THAN INSTALLING DUNNAGE AS SPECIFIED IN GENERAL NOTE "E" 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 8, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A LOAD STRAP WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
5. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A LOAD MAY BE REDUCED BY MULTIPLES OF TWO (2) PALLET UNITS BY OMITTING LATERALLY ADJACENT UNITS FROM THE TOP LAYER OF ONE OR MORE LOAD UNITS OR BY MULTIPLES OF FOUR (4) PALLET UNITS BY OMITTING ONE OR MORE ENTIRE LOAD UNITS. TO REDUCE A LOAD BY ONE (1) PALLET UNIT, REFER TO THE LCL PROCEDURES ON PAGES 16 AND 17 FOR GUIDANCE.
6. FOR SHIPMENT OF ONE LEFTOVER CONTAINER, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGES 33 AND 34 FOR GUIDANCE.
7. IF THE BOXCAR TO BE USED IS EQUIPPED WITH 16 DOORWAY MEMBERS, AN ADDITIONAL FOUR UNITS MAY BE LOADED IN THE CENTER OF THE CAR, ADDING A SECOND TIER TO LENGTHWISE STACKS NUMBERED 5. ADDITIONAL DOORWAY MEMBERS MUST BE INSTALLED AT THE HEIGHTS SPECIFIED IN THE "SECTION C-C" VIEW ON PAGE 8.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
2" X 4"	322	215
NAILS	NO. REQD	POUNDS
10d (3")	216	3-1/2
12d (3-1/4")	30	1/2
WIRE, NO. 14 GAGE ----- 36' REQD ----- 1/2 LB		

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	36 -----	115,308 LBS
DUNNAGE -----		435 LBS
TOTAL WEIGHT -----		115,743 LBS

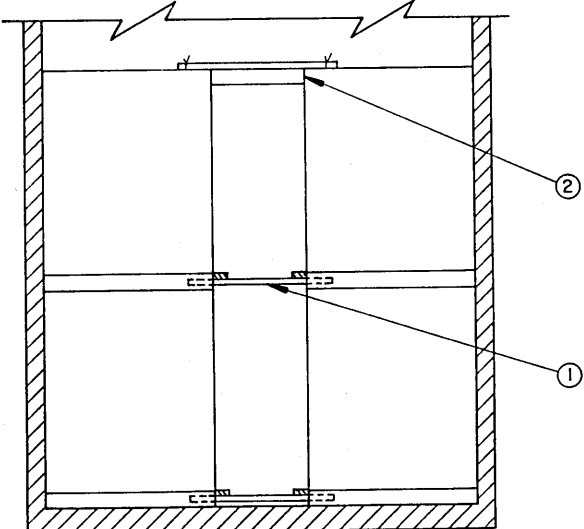


ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (20 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2 AND SPECIAL NOTE 3 ON PAGE 11.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (6 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNIT WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. SEE SPECIAL NOTE 4 ON PAGE 11.
- ③ STRUT ASSEMBLY (1 REQD). SEE THE "STRUT ASSEMBLY FOR 1-PIECE BULKHEADS" DETAIL ON PAGE 41. INSTALL BETWEEN LOAD DIVIDER BULKHEADS. SEE SPECIAL NOTE 6 ON PAGE 11.
- ④ DOORWAY PROTECTION (2 REQD). SEE THE "DOORWAY PROTECTION" DETAIL ON PAGE 12. NAIL TO THE DOOR POSTS W/12d NAILS. SEE SPECIAL NOTE 5 ON PAGE 11.

SEE GENERAL NOTE "E" ON PAGE 2.



SECTION D-D

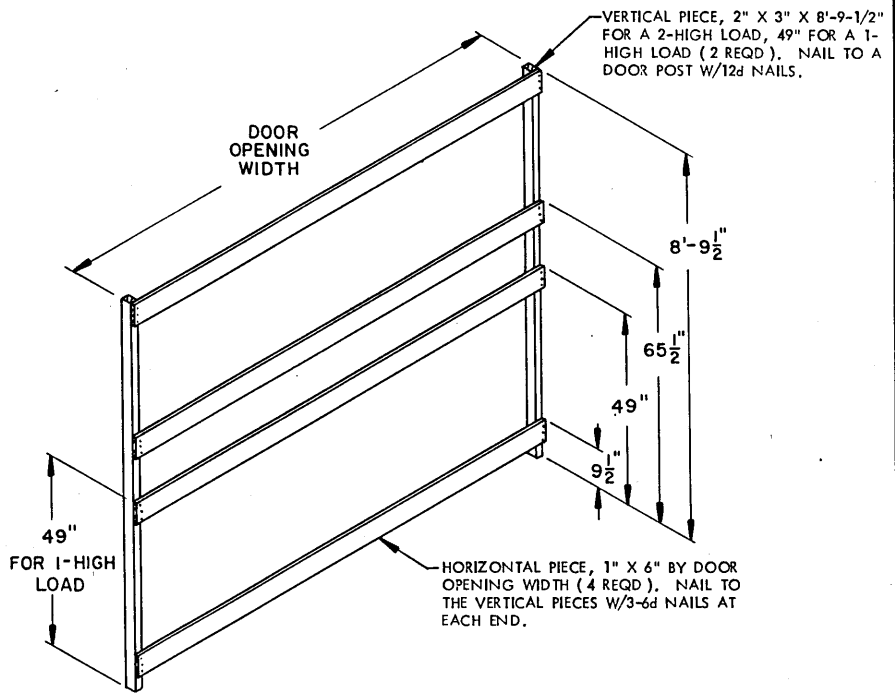
SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE WOOD-LINED CUSHIONED BOXCAR EQUIPPED WITH LOAD DIVIDER BULKHEADS AND WITH 10'-0" WIDE DOOR OPENINGS IS SHOWN. CARS OF OTHER DIMENSIONS AND CARS HAVING NARROWER OR WIDER DOOR OPENINGS CAN BE USED.
2. A MAXIMUM OF FORTY-EIGHT (48) PALLET UNITS, FOR AN APPROXIMATE LADING WEIGHT OF 153,744 POUNDS, CAN BE PLACED IN A 60'-8" LONG CAR, OR A MAXIMUM OF THIRTY-TWO (32) UNITS CAN BE LOADED IN A 40'-6" LONG CAR FOR AN APPROXIMATE LADING WEIGHT OF 102,496 POUNDS, WHEN USING THE DEPICTED PROCEDURES.
3. IF THE "ALTERNATIVE DOORWAY PROTECTION F" PROCEDURES AS SHOWN ON PAGE 40 ARE USED IN LIEU OF THE WOODEN DOOR GATE TYPE PROTECTION, PIECE MARKED (4), NAILED FLOORLINE BLOCKING MUST BE USED IN LIEU OF THE LOWER ANTI-SWAY BRACES IN THE DOORWAY AREA. NAILED BLOCKING IS REQUIRED FOR ALL PALLET STACKS WHICH ARE COMPLETELY WITHIN THE DOORWAY AREA OR WHICH EXTEND INTO THE DOORWAY AREA BY ONE-HALF OR MORE OF THE STACK WIDTH ON EITHER SIDE OF THE CAR.
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 A LOAD STRAP WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
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 WIDTH. THE WOODEN GATE TYPE OF DOORWAY PROTECTION, SHOWN AS PIECE MARKED (4) IN THE LOAD ON PAGE 10, IS APPLICABLE FOR BOXCARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS AND NAILABLE DOOR POSTS. REFER TO PAGES 38 THRU 40 FOR ALTERNATIVE DOORWAY PROTECTION FOR CARS EQUIPPED WITH CONVENTIONAL SLIDING DOORS. IF THE CAR BEING LOADED IS EQUIPPED WITH PLUG TYPE DOORS, NAILED FLOORLINE BLOCKING AND LOAD BUNDLING STRAPS MUST BE USED. SEE THE "ALTERNATIVE DOORWAY PROTECTION F" DETAIL ON PAGE 40 FOR GUIDANCE.
6. A STRUT ASSEMBLY, SHOWN AS PIECE MARKED (3) IN THE LOAD ON PAGE 10, IS REQUIRED BETWEEN THE LOAD DIVIDER BULKHEADS WHEN THE LOAD IN EITHER END OF THE CAR IS 50,000 POUNDS OR MORE. FOR THE DEPICTED PALLET UNIT, A STRUT ASSEMBLY WILL BE REQUIRED IF THE LOAD IN ONE END OF THE CAR CONSISTS OF MORE THAN THREE (3) LOAD UNITS, WHICH WOULD BE THE CASE IF AN OFFSET LOADING PATTERN IS EMPLOYED. THE STRUT ASSEMBLY WILL ALWAYS BE REQUIRED FOR FULL LOADS IN ALL CARS.
7. THE DEPICTED LOAD CAN BE REDUCED TO SUIT THE QUANTITY TO BE SHIPPED. A 2-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF FOUR (4) UNITS, OR A 1-TIER LOAD CAN BE REDUCED BY A MULTIPLE OF TWO (2) UNITS BY OMITTING ONE OR MORE LOAD UNITS FROM THE CENTER PORTION OF THE LOAD. OR, THE ENTIRE TOP TIER CAN BE OMITTED. FOR OTHER METHODS OF REDUCING A LOAD, AND FOR TYPICAL LCL PROCEDURES, REFER TO PAGES 15 THRU 32 FOR GUIDANCE.
8. FOR SHIPMENT OF ONE LEFTOVER CONTAINER, SEE THE "PROCEDURES FOR SHIPMENT OF LEFTOVER CONTAINERS" ON PAGES 33 AND 34 FOR GUIDANCE.

BILL OF MATERIAL		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	80	40
1" X 8"	16	11
2" X 3"	36	18
2" X 4"	391	261
4" X 4"	12	16
NAILS	NO. REQD	POUNDS
6d (2")	64	1/2
10d (3")	258	4
12d (3-1/4")	82	1-1/2
WIRE, NO. 14 GAGE ----- 36' REQD -----		1/2 LB

LOAD AS SHOWN

<u>ITEM</u>	<u>QUANTITY</u>	<u>WEIGHT (APPROX)</u>
PALLET UNIT -----	40 -----	128,120 LBS
DUNNAGE -----		699 LBS
TOTAL WEIGHT -----		128,819 LBS



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

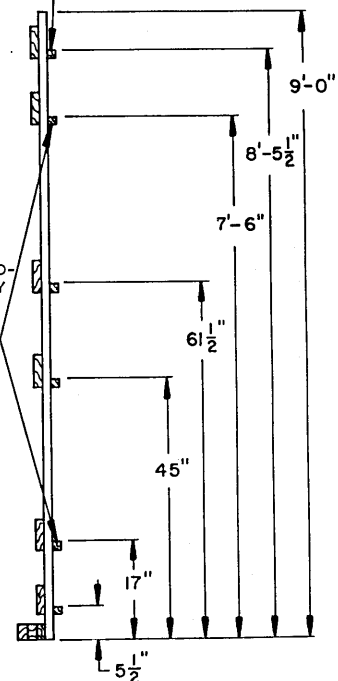
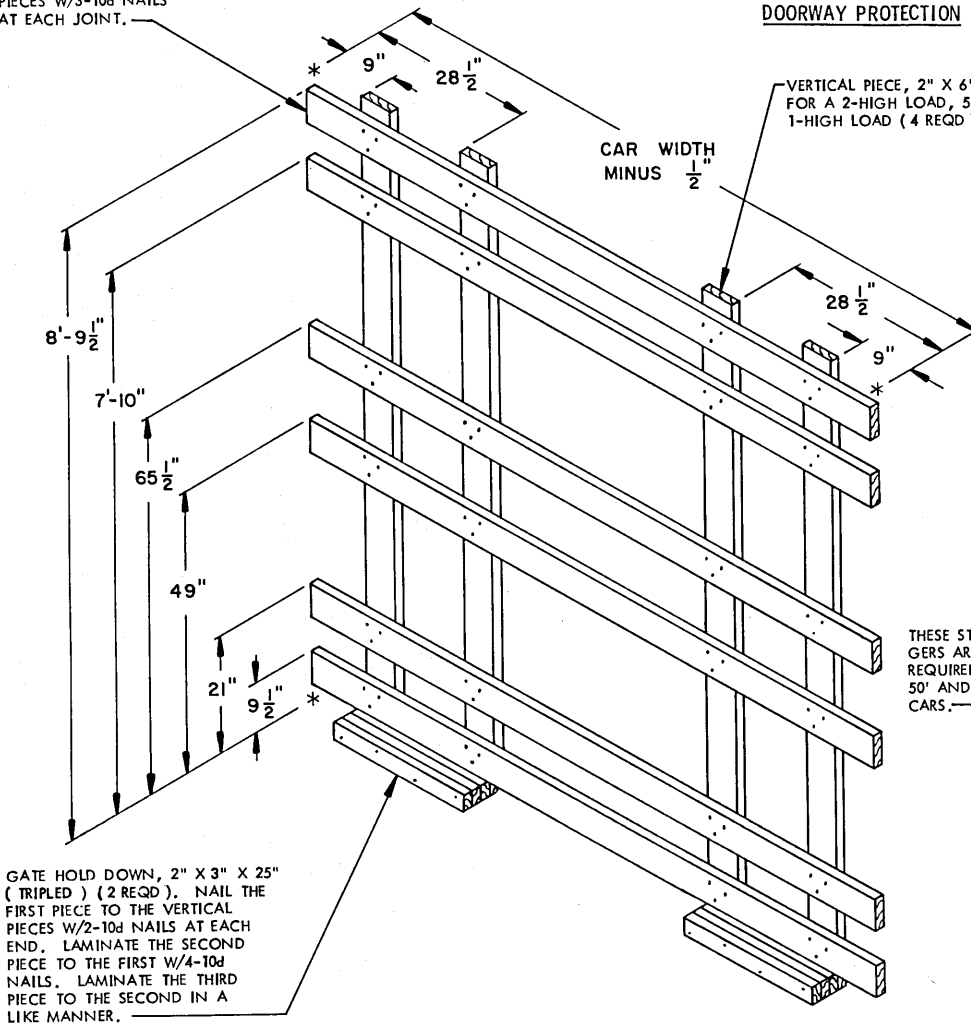
DOORWAY PROTECTION

VERTICAL PIECE, 2" X 6" X 9'-0" FOR A 2-HIGH LOAD, 51" FOR A 1-HIGH LOAD (4 REQD).

CAR WIDTH MINUS 1/2"

STRUT LEDGER, 2" X 2" BY CAR WIDTH MINUS 18-1/2" IN LENGTH (6 REQD FOR 50' AND 60' CARS, 4 REQD FOR A 40' CAR). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT.

THESE STRUT LEDGERS ARE ONLY REQUIRED FOR 50' AND 60' CARS.



CENTER GATE A

END VIEW

DETAILS

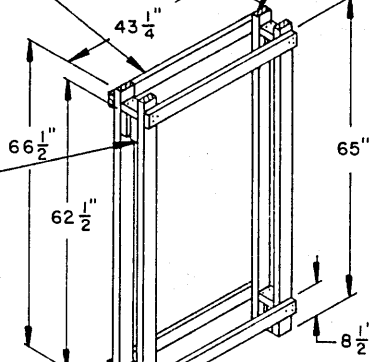
HORIZONTAL PIECE, 2" X 4" X 43-1/4" (4 REQD).
NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT
EACH END.

VERTICAL PIECE, 2" X 4" X
66-1/2" (4 REQD).

HORIZONTAL PIECE, 2" X 4" X 43-1/4"
(4 REQD). NAIL TO THE VERTICAL
PIECES W/3-10d NAILS AT EACH END.

STRUT, 2" X 4" BY A LENGTH
TO SUIT (REF: 4") (4 REQD).
NAIL TO THE STRUT SUPPORT
PIECES W/2-10d NAILS AT
EACH END.

STRUT SUPPORT PIECE,
2" X 4" X 6" (8 REQD).
NAIL TO A VERTICAL
PIECE W/2-10d NAILS.

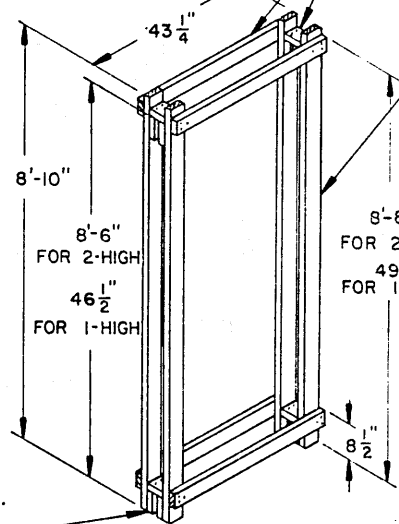


STRUT, 2" X 4" BY A LENGTH
TO SUIT (REF: 4") (4 REQD).
NAIL TO THE STRUT SUPPORT
PIECES W/2-10d NAILS AT
EACH END.

CRIB FILL B

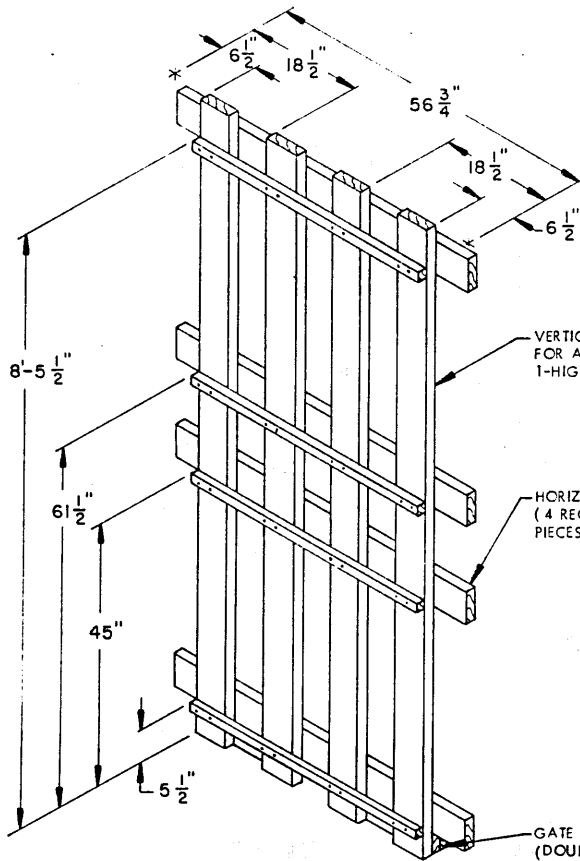
CRIB FILL "B" IS NOT REQUIRED FOR
A 1-HIGH LOAD; USE CRIB FILL "A"
THROUGHOUT THE LENGTH OF THE
LOAD.

STRUT SUPPORT PIECE,
2" X 4" X 6" (8 REQD).
NAIL TO A VERTICAL
PIECE W/2-10d NAILS.



CRIB FILL A

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



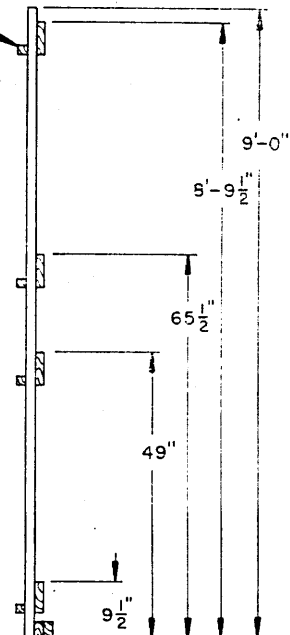
CENTER GATE B

STRUT LEDGER, 2" X 4" X 43-3/4"
(4 REQD). NAIL TO THE VERTICAL
PIECES W/2-10d NAILS AT
EACH END.

VERTICAL PIECE, 2" X 6" X 9'-0"
FOR A 2-HIGH LOAD, 54" FOR A
1-HIGH LOAD (4 REQD).

HORIZONTAL PIECE, 2" X 6" X 56-3/4"
(4 REQD). NAIL TO THE VERTICAL
PIECES W/3-10d NAILS AT EACH JOINT.

GATE HOLD-DOWN, 2" X 3" X 17-1/2"
(DOUBLED) (2 REQD). NAIL THE FIRST
PIECE TO THE VERTICAL PIECES W/2-10d
NAILS AT EACH JOINT. LAMINATE THE
SECOND PIECE TO THE FIRST W/4-10d
NAILS.

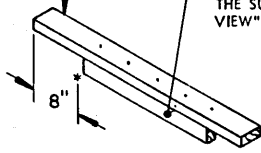


END VIEW

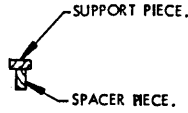
DETAILS

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 UNITS MINUS 1/4" (1 REQD). POSITION SO AS TO BE CENTERED UNDER THE SUPPORT PIECE. SEE THE "END VIEW" BELOW.



TOP-OF-LOAD ANTI-SWAY BRACE

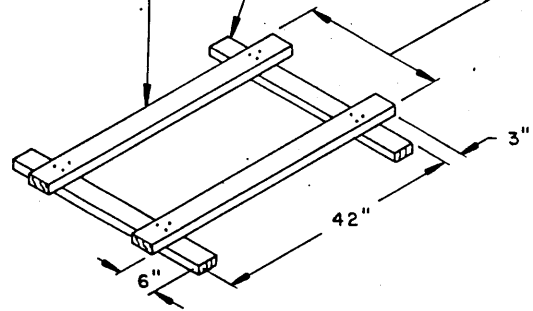


END VIEW

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

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

FABRICATE TO FIT BETWEEN THE POSTS OF LATERALLY ADJACENT UNITS.



ANTI-SWAY BRACE

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 UNIT PRIOR TO POSITIONING THE LATERALLY ADJACENT UNIT.

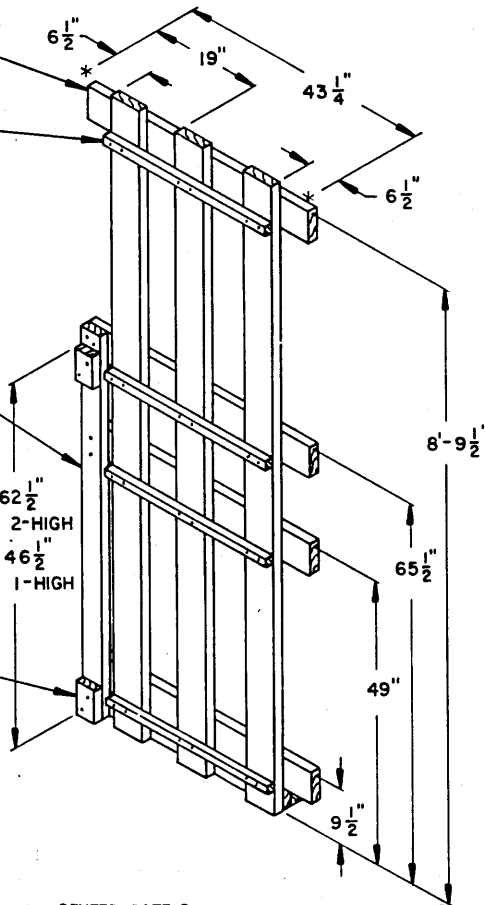
HORIZONTAL PIECE, 2" X 6" X 43-1/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.

STRUT LEDGER, 2" X 2" X 30-1/4" (4 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH END.

STOP PIECE, 2" X 4" X 65-1/2" FOR A 2-HIGH LOAD, 49" FOR A 1-HIGH LOAD (1 REQD). NAIL TO THE HORIZONTAL PIECES W/2-10d NAILS AT EACH JOINT.

STRUT LEDGER, 2" X 4" X 6" (2 REQD). NAIL TO THE STOP PIECE W/2-10d NAILS.

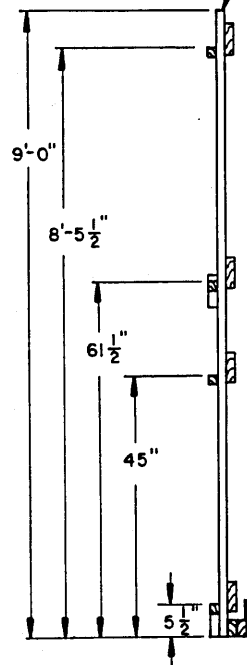
62 1/2"
FOR 2-HIGH
46 1/2"
FOR 1-HIGH



CENTER GATE C

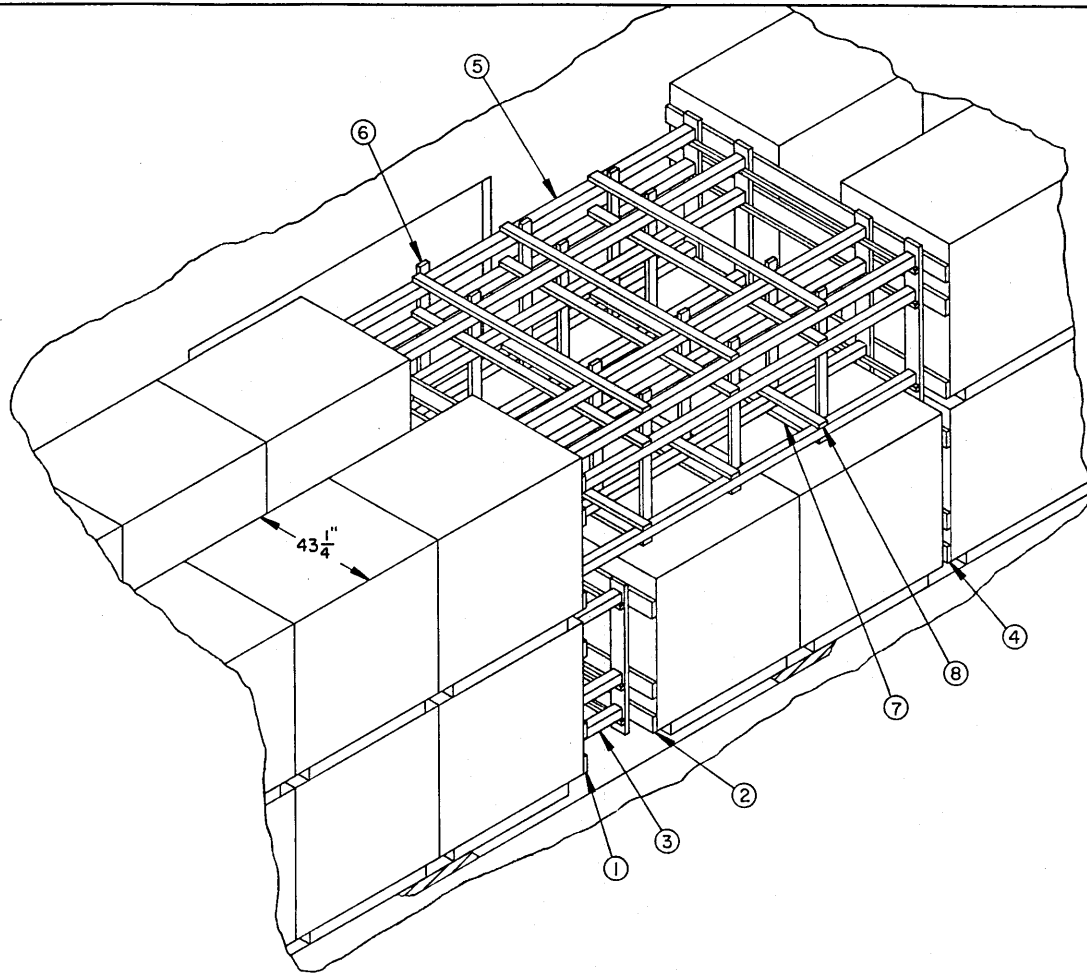
(1 RIGHT HAND AND 1 LEFT HAND GATE REQUIRED)

VERTICAL PIECE, 2" X 6" X 9'-0" FOR A 2-HIGH LOAD, 51" FOR A 1-HIGH LOAD (3 REQD).



END VIEW

GATE HOLD-DOWN, 2" X 3" X 30-1/4" (TRIPLED) (1 REQD). NAIL TO THE VERTICAL PIECES W/2-10d NAILS AT EACH JOINT. LAMINATE THE SECOND PIECE TO THE FIRST W/4-10d NAILS. LAMINATE THE THIRD PIECE TO THE SECOND IN A LIKE MANNER.



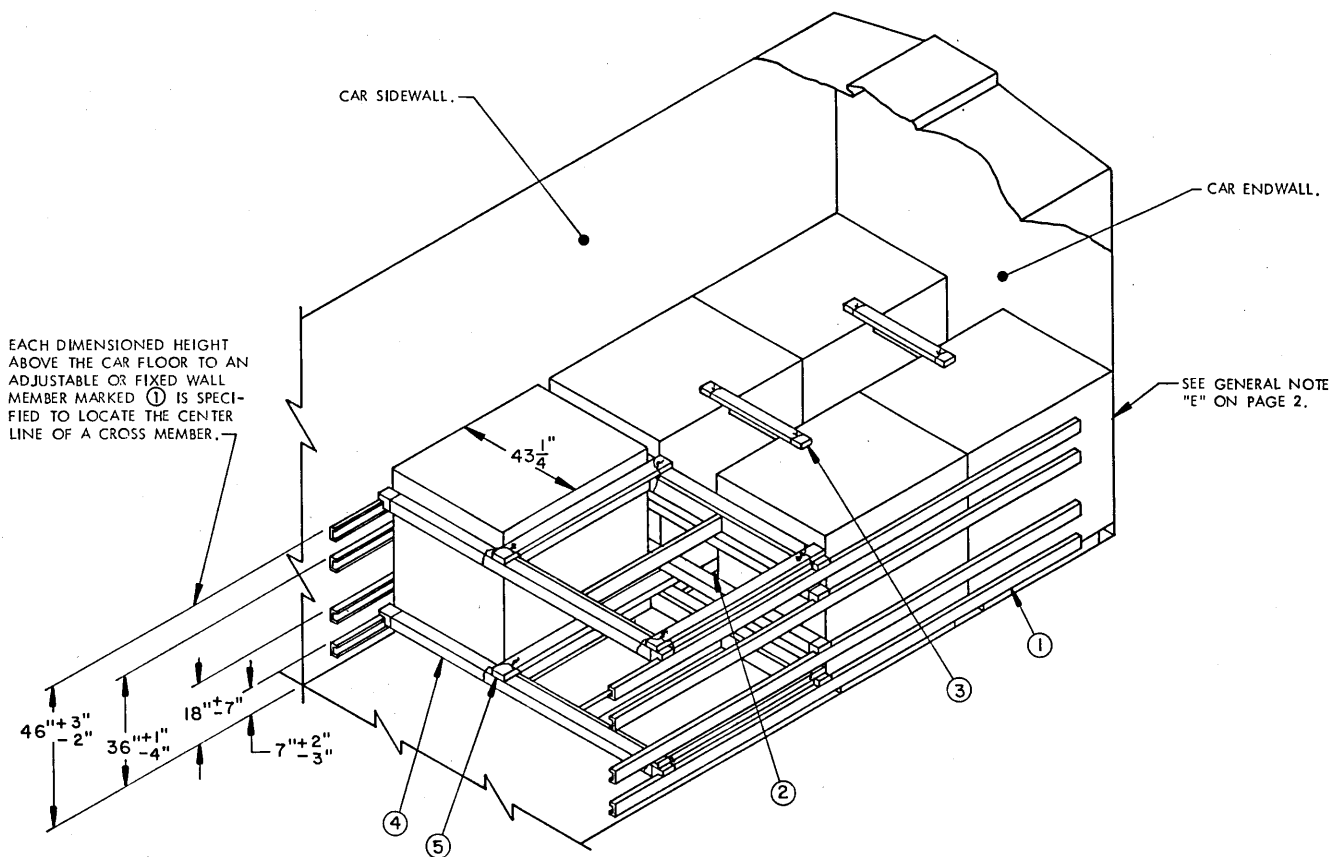
ISOMETRIC VIEW

SPECIAL NOTES:

1. ONLY THE CENTER PORTION OF A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN TO PORTRAY THE STRUTTED GATE METHOD OF PARTIAL-LAYER BRACING. CARS OF OTHER WIDTHS CAN ALSO BE USED.
2. 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.
3. ONLY THE BLOCKING AND BRACING PIECES WHICH ARE NECESSARY TO PERMIT THE OMISSION OF THE UNITS FROM THE TOP LAYER ARE SHOWN.
4. TO PROTECT THE LADING FROM BEING PUNCTURED WHEN A SET OF VERTICAL STRUT BRACING IS INSTALLED ABOVE THE LOWER LAYER OF A LOAD, A SUITABLE LENGTH PAD OF 2" X 4" MATERIAL, SHOWN AS PIECE MARKED ⑦, MUST BE POSITIONED UNDER AND SECURED TO EACH APPLICABLE VERTICAL STRUT BRACING PIECE.

KEY NUMBERS

- ① CENTER GATE FOR 2-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12.
- ② CENTER GATE FOR 1-HIGH (1 REQD). SEE THE "CENTER GATE A" DETAIL ON PAGE 12.
- 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 "J", "Q" AND "R" ON PAGE 2.
- ④ CENTER GATE FOR 2-HIGH (MODIFIED) (1 REQD). CONSTRUCT AS SHOWN IN THE "CENTER GATE A" DETAIL FOR 2-HIGH ON PAGE 12, EXCEPT OMIT THE STRUT LEDGERS AT 5-1/2", 17" AND 45" (THE BOTTOM THREE STRUT LEDGERS).
- ⑤ STRUT, 4" X 4" BY CUT TO FIT (12 REQD). TOENAIL TO PIECES MARKED ① AND ④ W/2-16d NAILS AT EACH END.
- ⑥ VERTICAL STRUT BRACING, 2" X 4" BY CUT TO EXTEND 3" ABOVE THE TOP STRUT (12 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 4 AT LEFT.
- ⑦ STRUT BRACING PAD, 2" X 4" BY LENGTH TO SUIT (3 REQD). POSITION UNDER THE VERTICAL STRUT BRACING AS SHOWN.
- ⑧ HORIZONTAL STRUT BRACING, 2" X 4" BY A LENGTH TO SUIT (9 REQD). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.



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.

ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-0" WIDE (INSIDE CLEARANCE) WOOD-LINED BOXCAR EQUIPPED WITH ADJUSTABLE AND/OR FIXED WALL MEMBERS IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. FIVE (5) UNITS ARE SHOWN AS A TYPICAL LOAD QUANTITY. THE NUMBER OF UNITS CAN BE ADJUSTED TO SUIT THE QUANTITY TO BE SHIPPED.
3. TOP-OF-LOAD ANTI-SWAY BRACES, SHOWN AS PIECES MARKED ③, MUST BE INSTALLED IN EACH END OF THE CAR AND WIRE TIED TO A UNIT WITH NO. 14 GAGE WIRE. THREE (3) BRACES ARE REQUIRED IN EACH END OF A LOAD REGARDLESS OF THE CAR LENGTH.
4. THE SPACER ASSEMBLIES, SHOWN AS PIECES MARKED ⑤, MAY ALSO BE USED IN AN UPPER LAYER OF A LOAD FOR THE OMISSION OF A PALLET UNIT. IF THE ASSEMBLIES ARE USED NEXT TO THE CAR ENDWALL IN EITHER A FIRST LAYER OR IN AN UPPER LAYER, AND THE ENDWALL 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 ENDWALL W/6-10d NAILS. IF THE ENDWALL IS NON-NAILABLE, CROSS MEMBERS MUST BE INSTALLED AT THE END OF THE LOAD TO SUPPORT THE SPACER ASSEMBLIES.

KEY NUMBERS

- ① WALL MEMBER, ADJUSTABLE OR FIXED. MEMBERS MUST BE LOCATED AT THE SPECIFIED HEIGHTS ABOVE THE CAR FLOOR TO PROVIDE PROPER ALIGNMENT OF CROSS MEMBERS MARKED ④.
- ② ANTI-SWAY BRACE (2 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2.
- ③ TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNIT AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37.
- ④ CROSS MEMBER (6 REQD). SEE GENERAL NOTE "T" ON PAGE 3.
- ⑤ SPACER ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 17 AND SPECIAL NOTE 4 AT LEFT. WIRE TIE TO CROSS MEMBERS W/2 WRAPS OF NO. 14 GAGE WIRE AT EACH CORNER.

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

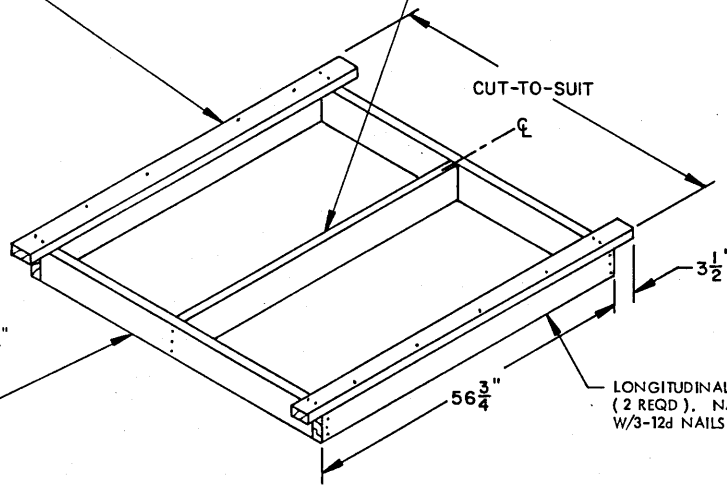
SUPPORT PIECE, 2" X 6" X 63-3/4"
(2 REQD). NAIL TO THE LATERAL
PIECES W/1-10d NAIL AT EACH END
AND TO A LONGITUDINAL PIECE
W/6-10d NAILS.

SPACER PIECE, 2" X 6" X
53-3/4" (1 REQD).

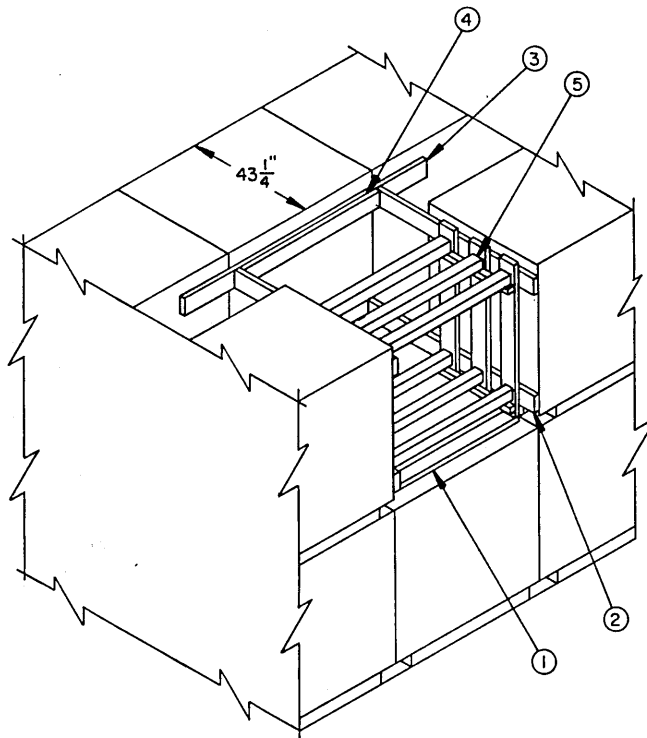
CUT-TO-SUIT

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

LONGITUDINAL PIECE, 2" X 6" X 56-3/4"
(2 REQD). NAIL TO THE LATERAL
PIECES W/3-12d NAILS AT EACH END.



SPACER ASSEMBLY



ISOMETRIC VIEW

SPECIAL NOTES:

1. A PARTIAL VIEW OF A 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE OMITTED-UNIT PROCEDURE SHOULD BE APPLIED NEAR THE CENTER OF THE CAR LENGTH, BUT NOT IN THE DOORWAY AREA. ALSO, THERE SHOULD BE AT LEAST ONE (1) LOAD UNIT BETWEEN THE OMITTED UNIT AND A CENTER GATE.
3. 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.

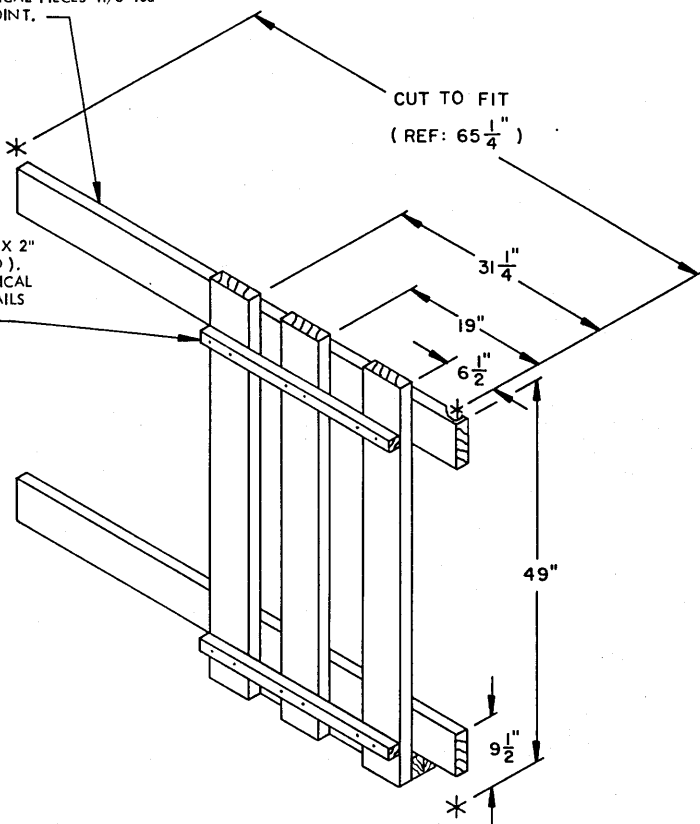
KEY NUMBERS

- ① SUPPORT PIECE, 2" X 6" X 56-3/4" (2 REQD). POSITION SO AS TO BE UNDER THE OUTWARD 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 DETAIL ON PAGE 19. NAIL TO THE FILLER PIECE, PIECE MARKED ④, W/3-10d NAILS. TOENAIL TO THE SUPPORT PIECE, PIECE MARKED ①, W/2-10d NAILS AT EACH JOINT. CAUTION: USE CARE NOT TO TOENAIL INTO A CONTAINER.
- ③ ANTI-SWAY BEARING PIECE, 2" X 6" X 7'-0" (1 REQD).
- ④ FILLER PIECE, 2" X 6" X 53-3/4" (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: 50") (6 REQD). TOENAIL TO PIECES MARKED ③ W/2-16d NAILS AT EACH END.

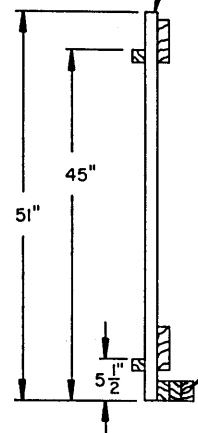
HORIZONTAL PIECE, 2" X 6" BY
 CUT TO FIT (REF: 65-1/4") (2 REQD).
 NAIL TO THE VERTICAL PIECES W/3-10d
 NAILS AT EACH JOINT.

CUT TO FIT
 (REF: 65 1/4")

STRUT LEDGER, 2" X 2"
 X 30-1/4" (2 REQD).
 NAIL TO THE VERTICAL
 PIECES W/2-10d NAILS
 AT EACH JOINT.



VERTICAL PIECE, 2" X 6"
 X 51" (3 REQD).

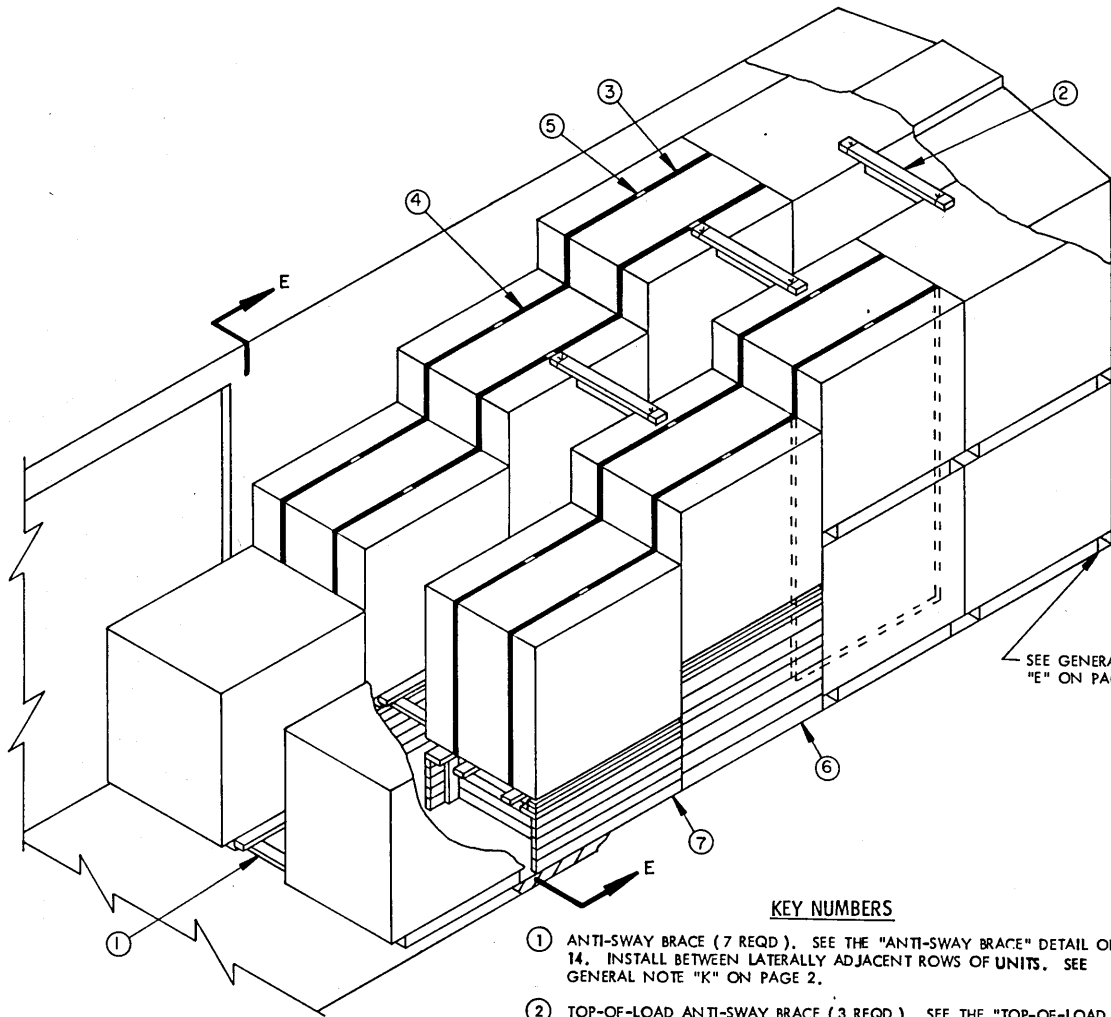


GATE HOLD DOWN, 2" X 3"
 X 30-1/4" (TRIPLED) (1
 REQD). NAIL THE FIRST
 PIECE TO THE VERTICAL
 PIECES W/2-10d NAILS AT
 EACH JOINT. LAMINATE
 THE SECOND PIECE TO THE
 FIRST W/4-10d NAILS. LAMI-
 NATE THE THIRD PIECE TO
 THE SECOND IN A LIKE
 MANNER.

END VIEW

LOAD BEARING GATE

ONE RIGHT HAND AND ONE LEFT HAND GATE
 REQUIRED. A RIGHT HAND GATE IS SHOWN.
 THE REFERENCE DIMENSION GIVEN FOR THE
 HORIZONTAL PIECES IS BASED ON AN INSIDE
 CAR WIDTH OF 9'-2". THIS DIMENSION WILL
 HAVE TO BE ADJUSTED WHEN LOADING CARS
 OF OTHER WIDTHS.

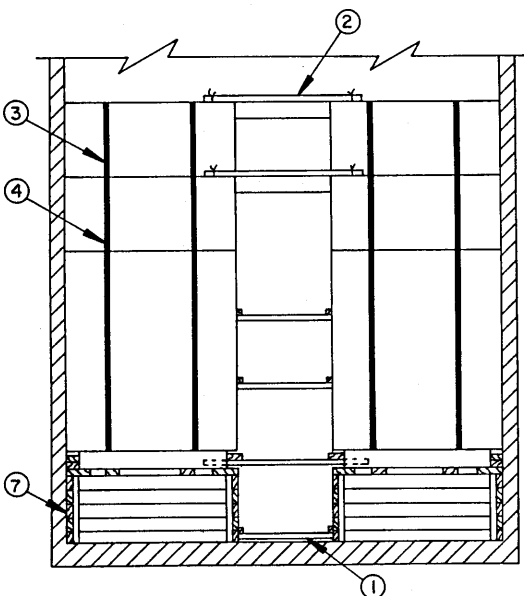


SEE GENERAL NOTE "E" ON PAGE 2.

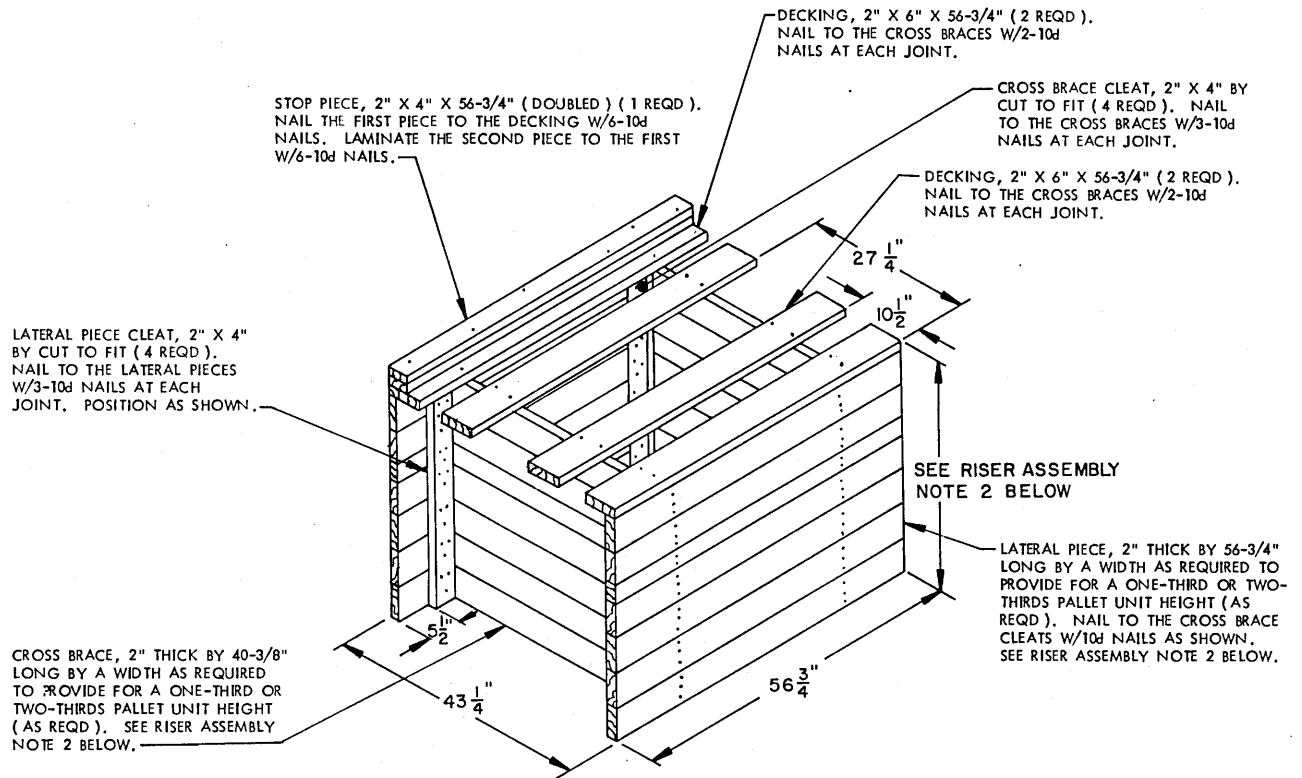
ISOMETRIC VIEW

KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (3 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNIT AS SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37.
- ③ UNITIZING STRAP, 1-1/4" X .035" OR .031" X 28'-5" LONG STEEL STRAPPING (4 REQD). INSTALL SO AS TO ENCIRCLE THE TWO UNITS.
- ④ REINFORCING STRAP, 1-1/4" X .035" X 19'-0" (REF) STEEL STRAPPING (8 REQD). INSTALL TO ENCIRCLE THE UNIT.
- ⑤ SEAL FOR 1-1/4" STRAPPING (24 REQD/2 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2 AND THE STRAP DETAIL ON PAGE 43.
- 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 21.
- ⑦ RISER ASSEMBLY (2 REQD). THE HEIGHT OF THESE RISER ASSEMBLIES WILL BE ONE-THIRD OF THE PALLET UNIT HEIGHT. SEE THE "RISER ASSEMBLY" DETAIL ON PAGE 21.



SECTION E-E



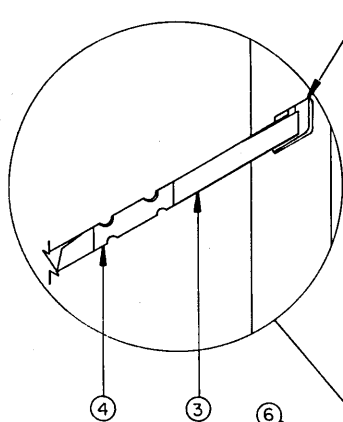
RISER ASSEMBLY

SPECIAL NOTES FOR LOAD:

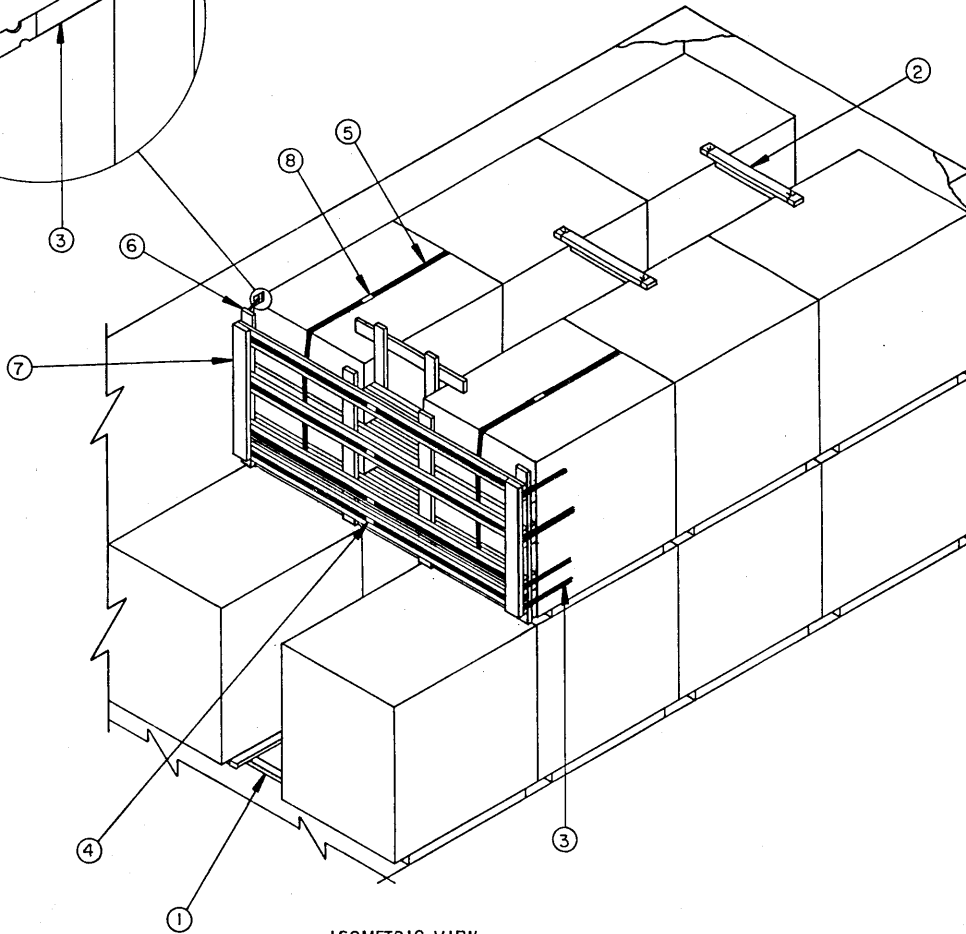
1. A 9'-2" WIDE CONVENTIONAL TYPE WOOD-LINED BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. ONLY THE BLOCKING AND BRACING FOR THE RISER METHOD OF PARTIAL-LAYER BRACING IS SHOWN. REFER TO THE APPLICABLE LOAD PAGE FOR THE BLOCKING AND BRACING REQUIREMENTS FOR THE BALANCE OF THE LOAD.

SPECIAL NOTES FOR RISER ASSEMBLY:

1. A TWO-THIRDS UNIT HEIGHT RISER IS SHOWN ABOVE AND AS KEY NUMBER ⑥ IN THE LOAD ON PAGE 20. EACH CROSS BRACE AND EACH LATERAL PIECE OF THE RISER IS FABRICATED FROM SIX (6) PIECES OF 2" X 6" MATERIAL AND ONE (1) PIECE OF 2" X 4" MATERIAL TO PROVIDE FOR A TOTAL HEIGHT OF 38" AFTER DECKING IS IN PLACE. A ONE-THIRD HEIGHT RISER SHOWN AS KEY NUMBER ⑦ IN THE LOAD ON PAGE 20, WILL BE FABRICATED FROM FIVE (5) PIECES OF 2" X 4" MATERIAL FOR EACH CROSS BRACE AND EACH LATERAL PIECE, TO PROVIDE FOR A TOTAL HEIGHT OF 19" AFTER THE DECKING IS IN PLACE.
2. SELECT THE PROPER WIDTH COMBINATIONS FOR THE LATERAL/CROSS BRACE PIECES PRIOR TO CONSTRUCTING A RISER ASSEMBLY, TO ASSURE THAT THE TOTAL HEIGHT OF THE RISER ASSEMBLY IS ONE-THIRD OR TWO-THIRDS OF THE PALLET UNIT HEIGHT, BASED ON THE LOCATION OF THE RISER ASSEMBLY WITHIN THE LOAD. **NOTE:** A PLUS OR MINUS 1" TOLERANCE IS PERMISSIBLE ON THE RISER HEIGHT.



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.



SEE GENERAL NOTE "E" ON PAGE 3.

ISOMETRIC VIEW

SPECIAL NOTES:

1. A 9'-4" WIDE ALL-METAL BOXCAR EQUIPPED WITH STRAP ANCHOR DEVICES AND HAVING AN AAR MECHANICAL DESIGNATION CLASS OF XL IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED.
2. THE BULKHEAD GATE METHOD OF PARTIAL-LAYER BRACING IS ONLY APPLICABLE FOR USE IN LOADS OF LENGTHWISE POSITIONED PALLET UNITS AS SHOWN IN THE VIEW ABOVE. PARTIAL LAYERS OF CROSSWISE POSITIONED PALLET UNITS WILL NOT BE RETAINED BY THE BULKHEAD GATE METHOD.
3. A BULKHEAD GATE USED IN CONJUNCTION WITH FOUR (4) BULKHEAD STRAPS WILL RETAIN UP TO 24,000 POUNDS OF LADING; THREE (3) BULKHEAD STRAPS WILL RETAIN UP TO 18,000 POUNDS OF LADING; A BULKHEAD GATE WITH TWO (2) STRAPS WILL RETAIN NOT MORE THAN 12,000 POUNDS. IF ONLY TWO STRAPS ARE USED, THEY MUST BE APPLIED OVER THE UPPER AND LOWER STRAPPING BOARDS.
4. THE ANCHOR DEVICES TO BE USED FOR THE ATTACHMENT OF THE BULKHEAD STRAPS MUST BE LOCATED AT LEAST SIX INCHES (6") TOWARD THE CAR END-WALL FROM THE OPPOSITE-THE-LOAD SIDE OF THE BULKHEAD GATE.
5. 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 UNIT. SEE THE STRAP JOINT DETAIL ON PAGE 43 AND GENERAL NOTE "L" ON PAGE 2.

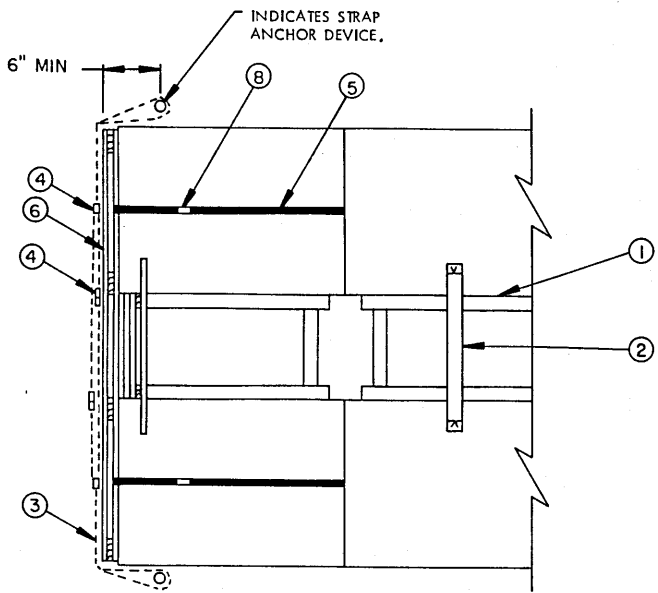
(CONTINUED AT RIGHT)

KEY NUMBERS

- ① ANTI-SWAY BRACE (7 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN THE LATERALLY ADJACENT ROWS OF UNITS. GENERAL NOTE "K" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (2 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNITS AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37.
- ③ BULKHEAD STRAP, 2" X .050" X 23'-0" LONG (REF) STEEL STRAPPING (4 REQD). INSTALL FROM 2 EQUAL LENGTH PIECES. SEE THE "STRAP APPLICATION PLAN VIEW" ON PAGE 23 FOR INSTALLATION GUIDANCE. SEE SPECIAL NOTES 3 THRU 5 AT LEFT.
- ④ SEAL FOR 2" STRAPPING (24 REQD, 6 PER STRAP). DOUBLE CRIMP EACH SEAL. SEE GENERAL NOTE "L" ON PAGE 2.
- ⑤ BUNDLING STRAP, 1-1/4" X .035" X 20'-0" LONG STEEL STRAPPING (2 REQD). ENCIRCLE THE PALLET UNIT AND THE HORIZONTAL PIECES OF THE BULKHEAD GATE. TENSION AND SEAL AFTER TENSIONING THE BULKHEAD STRAPS, PIECES MARKED ③.
- ⑥ BULKHEAD GATE (1 REQD). SEE THE DETAIL ON PAGE 23. SEE SPECIAL NOTE 2 AT LEFT.
- ⑦ 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.
- ⑧ SEAL FOR 1-1/4" STEEL STRAPPING (2 REQD, 1 PER STRAP). DOUBLE CRIMP EACH SEAL.

(SPECIAL NOTES CONTINUED)

6. THE STRAPPING BOARDS ON A BULKHEAD GATE ARE TO BE ALIGNED AS NEARLY AS POSSIBLE WITH THE ANCHOR DEVICES IN THE CAR TO WHICH THE BULKHEAD STRAPS ARE ATTACHED. TOLERANCES ARE SPECIFIED ON THE END VIEW OF THE BULKHEAD GATE ON PAGE 23 FOR THE LOCATION OF THE HORIZONTAL PIECES IN RELATION TO THE LOCATION OF THE STRAPPING BOARDS. THE STRAPPING BOARDS/HORIZONTAL PIECES SHOULD BE LOCATED WITHIN THESE TOLERANCES. IF THIS IS NOT POSSIBLE, ADDITIONAL HORIZONTAL PIECES MUST BE APPLIED, AS NECESSARY TO PROVIDE PROPER BEARING AGAINST THE CONTAINERS.



STRAP APPLICATION PLAN VIEW

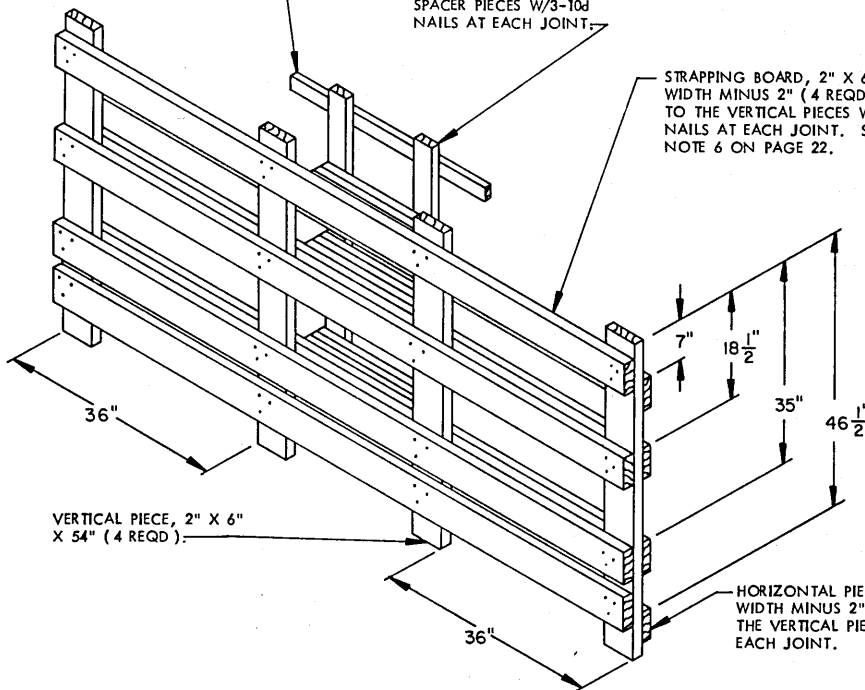
(KEY NUMBERS REFER TO KEY NOTES ON PAGE 22)

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.

RISER PIECE, 2" X 4" X 58" (2 REQD). NAIL TO THE SPACER PIECES W/3-10d NAILS AT EACH JOINT.

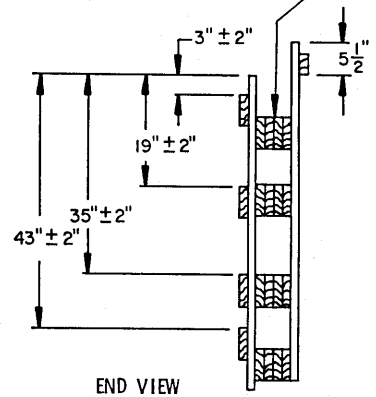
STRAPPING BOARD, 2" X 6" BY LOAD WIDTH MINUS 2" (4 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT. SEE SPECIAL NOTE 6 ON PAGE 22.

SPACER PIECE, 2" X 6" BY WIDTH OF LATERAL VOID MINUS 2" (QUADRUPLED) (4 REQD). NAIL THE FIRST PIECE TO A HORIZONTAL PIECE W/5-10d NAILS. NAIL EACH ADDITIONAL PIECE IN A LIKE MANNER.



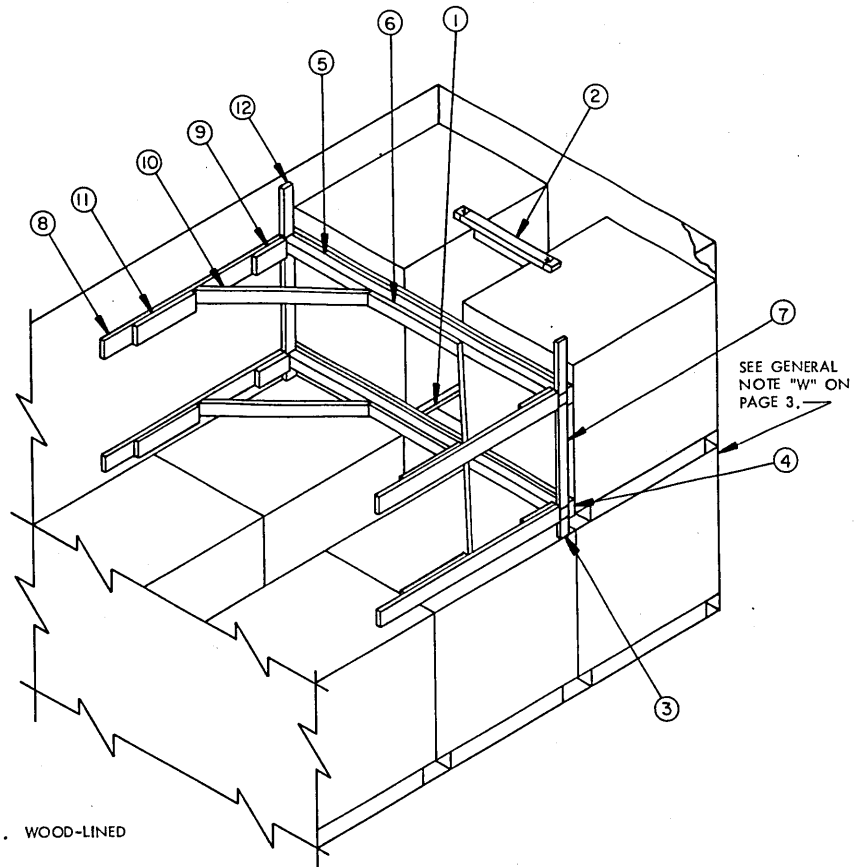
VERTICAL PIECE, 2" X 6" X 54" (4 REQD).

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



END VIEW

BULKHEAD GATE



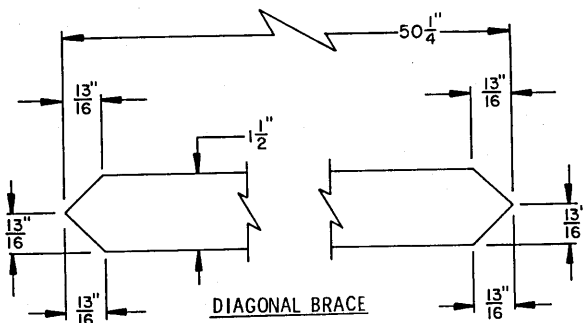
ISOMETRIC VIEW

KEY NUMBERS

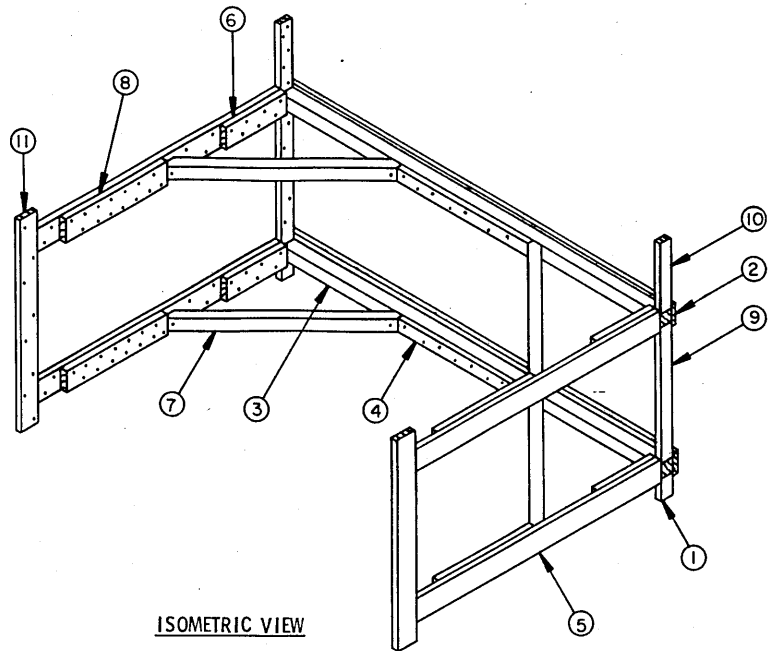
- ① ANTI-SWAY BRACE ASSEMBLY (2 REQD). SEE THE "ANTI-SWAY BRACE" DETAIL ON PAGE 14. INSTALL BETWEEN LATERALLY ADJACENT ROWS OF UNITS. SEE GENERAL NOTE "K" ON PAGE 2.
- ② TOP-OF-LOAD ANTI-SWAY BRACE (1 REQD). SEE THE "TOP-OF-LOAD ANTI-SWAY BRACE" DETAIL ON PAGE 14. WIRE TIE TO A LOAD STRAP ON THE UNITS WITH NO. 14 GAGE WIRE AS TYPICALLY SHOWN BY THE "TIE WIRE APPLICATION" DETAIL ON PAGE 37. NOTE THAT THE QUANTITY IS ONLY FOR THE PARTIAL-TIER UNITS.
- ③ SUPPORT CLEAT, 2" X 4" X 6" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. SEE SPECIAL NOTE 3 AT LEFT.
- 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 AT LEFT.
- ⑦ SPACER CLEAT, 2" X 4" X 35" (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 DETAIL BELOW 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:

1. A 9'-2" WIDE CONVENTIONAL WOOD-LINED BOXCAR IS SHOWN. WOOD-LINED 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 8,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 25, 26 AND 27 FOR SELECTION OF THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE.
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 DUNNAGE. PIECES MARKED ③, ④, ⑤, ⑦, ⑨ AND ⑫ MUST BE SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑩ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑧ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 60"), TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑧ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑧ IS DOUBLED.
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.



SEE SPECIAL NOTE 3 ABOVE.



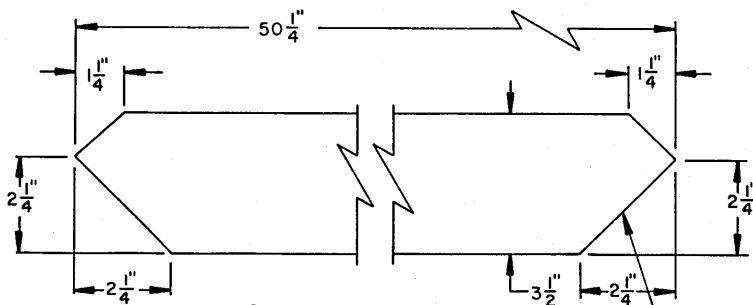
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. THE TYPE "B" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 14,000 POUNDS. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAILS ON PAGES 26 AND 27 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 24 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, ⑨ AND ⑪ MUST SUPPORTED AT THE SIDES OF A CAR BY A CAR SIDEWALL. IT IS ALRIGHT FOR THE ENDS OF THE DIAGONAL BRACES MARKED ⑦ TO BEAR IN FRONT OF A DOOR OPENING, HOWEVER, THE ADJACENT PIECE MARKED ⑤ MUST BE DOUBLED AND EXTENDED ACROSS AND FAR ENOUGH PAST THE DOOR OPENING (REF: 54") TO PROVIDE FOR THE SPECIFIED NAILING OF EACH PIECE. LAMINATE THE SECOND PIECE OF THE DOUBLED PIECE MARKED ⑤ TO THE FIRST W/16-16d NAILS. CLINCH THOSE NAILS WHICH PROTRUDE THRU THE HORIZONTAL WALL CLEAT WITHIN THE DOOR OPENING. NOTE THAT THE DIAGONAL BRACE WILL BE 49-1/8" LONG IN LIEU OF 50-1/4" WHEN PIECE MARKED ⑤ IS DOUBLED.
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. REFER TO PAGE 24 FOR A TYPICAL INSTALLATION OF A K-BRACE.

- ① SUPPORT CLEAT, 2" X 4" X 6" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "K" 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 38" (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/1-6d 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 35" (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.
- ⑪ VERTICAL BACK-UP CLEAT, 2" X 6" BY UNIT HEIGHT (2 REQD). NAIL TO THE CAR SIDEWALL W/8-12d NAILS.



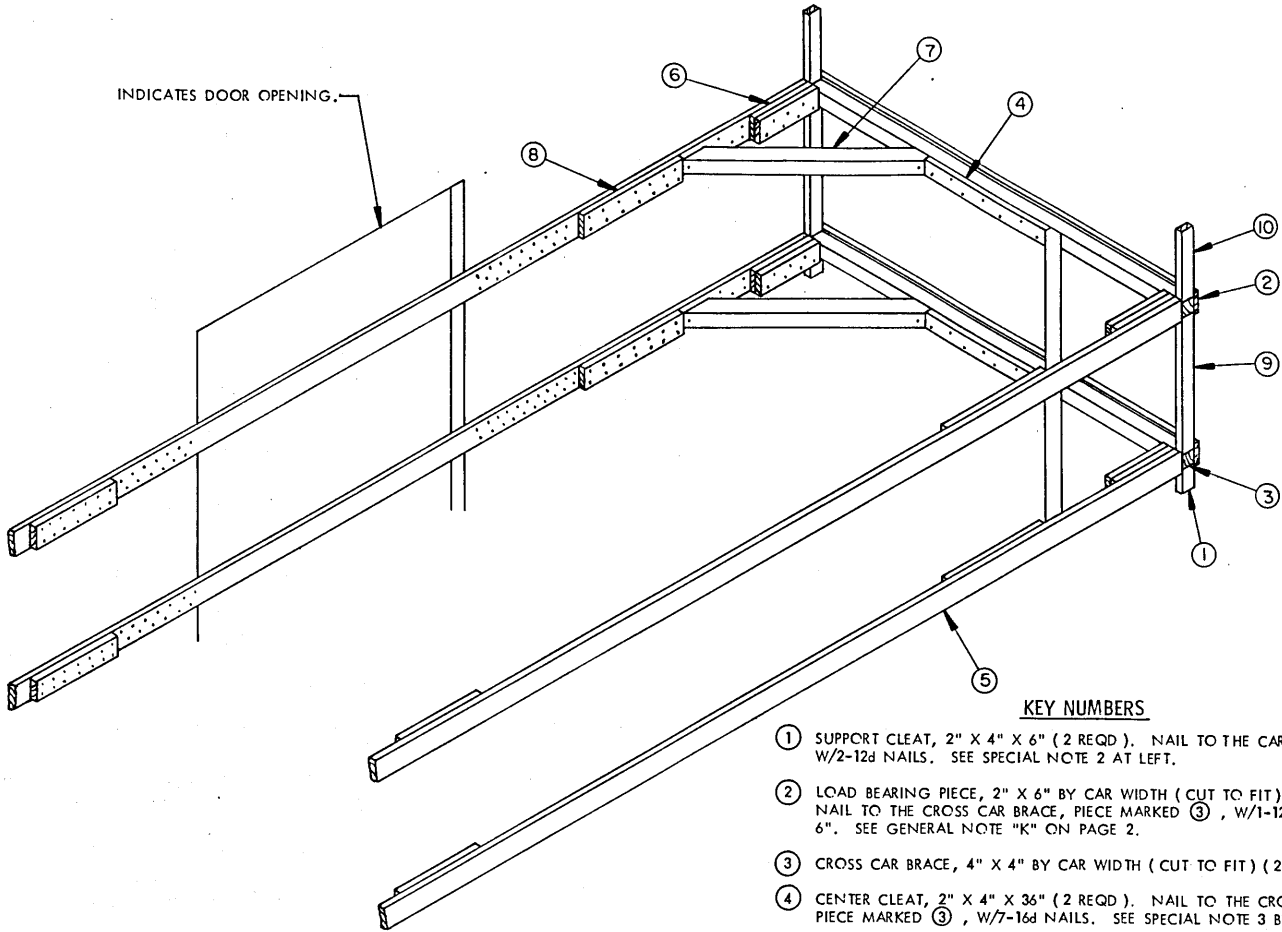
DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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

TYPE "B" K-BRACE

INDICATES DOOR OPENING.



ISOMETRIC VIEW

KEY NUMBERS

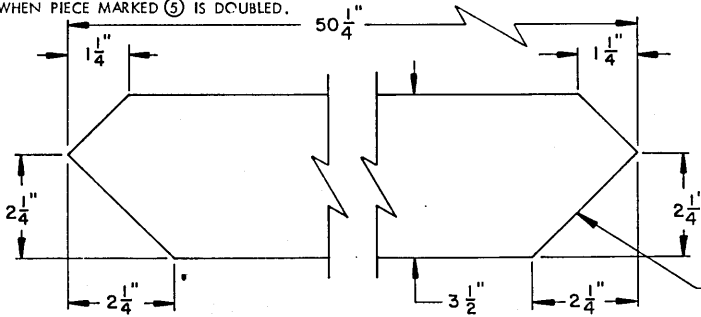
- ① SUPPORT CLEAT, 2" X 4" X 6" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "K" ON PAGE 2.
- ③ CROSS CAR BRACE, 4" 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 35" (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. IF IT IS NECESSARY TO BLOCK A HEAVIER LOAD, REFER TO THE DETAIL ON PAGE 27 FOR THE APPLICABLY SIZED K-BRACE TO USE AND THE DESIGN SPECIFICATIONS FOR THE BRACE. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 8,000 POUNDS AND 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 25 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 24 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, 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)

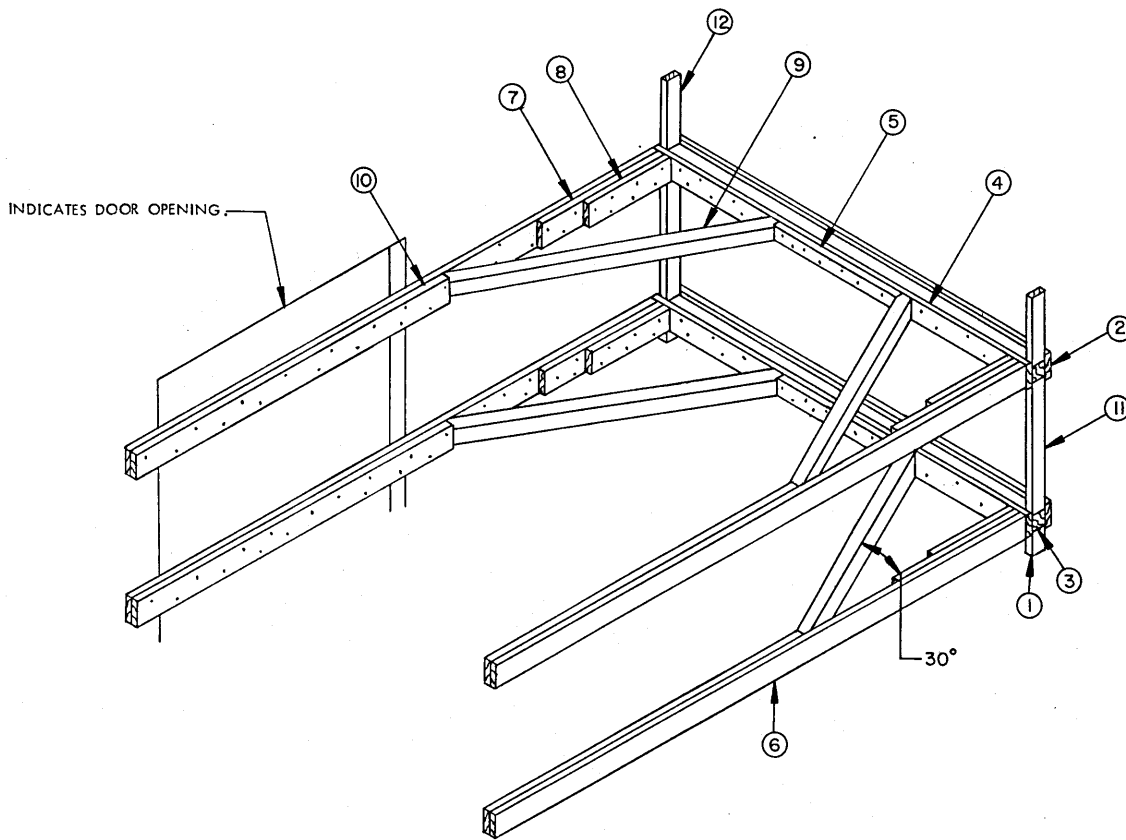
3. THE CENTER CLEAT, SHOWN AS PIECE MARKED ④, WILL BE 28" LONG FOR AN 8'-6" WIDE CAR, 36" LONG FOR A 9'-2", AND 38" LONG FOR A 9'-4" WIDE CAR. ADJUST THE LENGTH PROPORTIONATELY FOR CARS OF OTHER WIDTHS.
4. **CAUTION:** A TYPE "C" K-BRACE MUST BE USED IN BOTH ENDS OF THE CAR; THE BRACE IS NOT DESIGNED FOR USE IN ONLY ONE END. NOTE THAT EXCEPT FOR PIECES MARKED ⑤, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.



DIAGONAL BRACE

SEE SPECIAL NOTE 2 ABOVE.

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



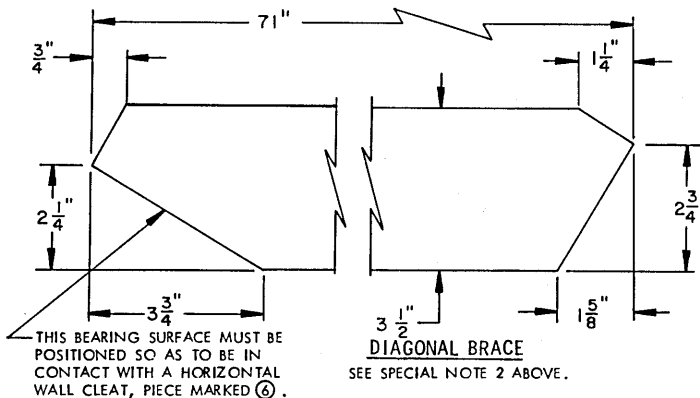
ISOMETRIC VIEW

SPECIAL NOTES:

1. THE TYPED "D" K-BRACE SHOWN IS ADEQUATE FOR RETAINING A PARTIAL TIER OF NOT MORE THAN 25,000 POUNDS. IF THE PARTIAL TIER TO BE BRACED WEIGHS BETWEEN 14,000 POUNDS AND 20,000 POUNDS, THE TYPE "C" K-BRACE DEPICTED ON PAGE 26 MAY BE USED. FOR A PARTIAL TIER OF 8,000 POUNDS TO 14,000 POUNDS, THE TYPE "B" K-BRACE DEPICTED ON PAGE 25 MAY BE USED. IF THE PARTIAL TIER TO BE BRACED WEIGHS 8,000 POUNDS OR LESS, THE TYPE "A" K-BRACE DEPICTED ON PAGE 24 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 ⑥ AND ⑩, THE QUANTITIES SPECIFIED ARE APPLICABLE ONLY FOR THE BRACE IN ONE END.

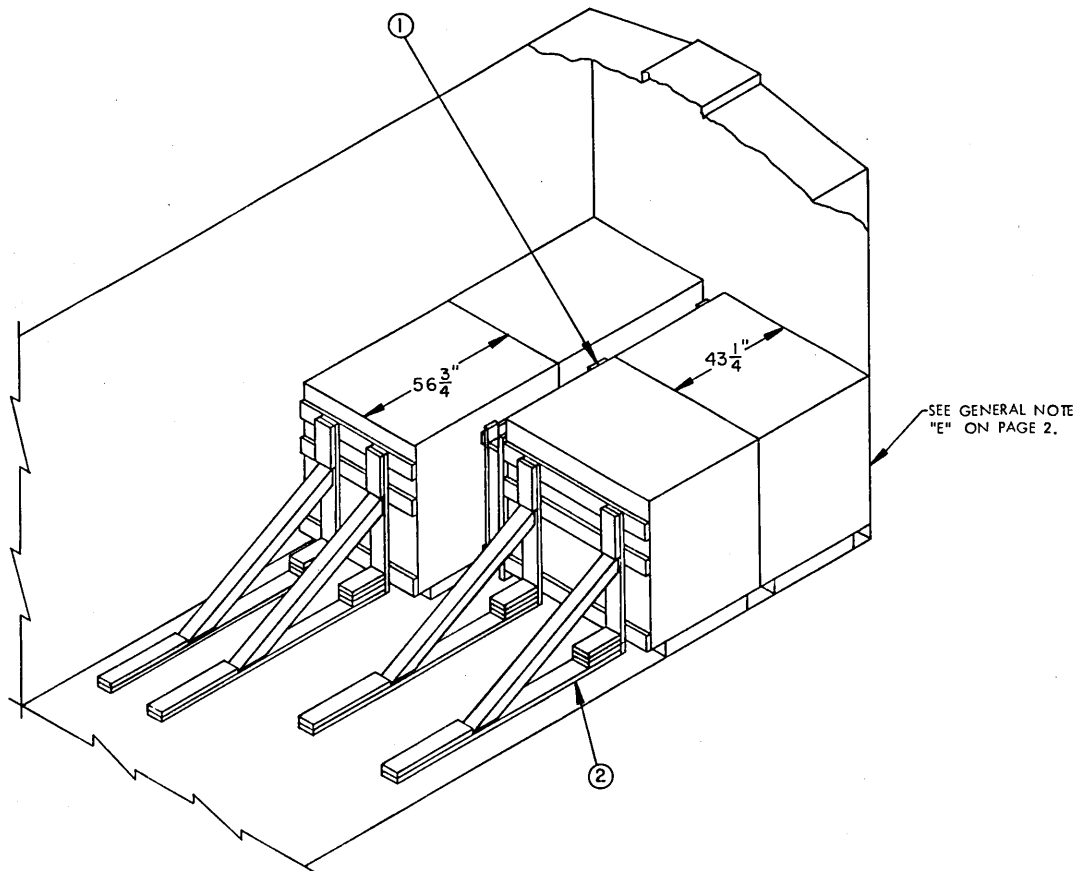
KEY NUMBERS

- ① SUPPORT CLEAT, 2" X 4" X 6" (2 REQD). NAIL TO THE CAR SIDEWALL W/2-12d NAILS. SEE SPECIAL NOTE 2 AT LEFT.
- ② LOAD BEARING PIECE, 2" X 6" BY CAR WIDTH (CUT TO FIT) (2 REQD). NAIL TO THE CROSS CAR BRACE, PIECE MARKED ③, W/1-12d NAIL EVERY 6". SEE GENERAL NOTE "K" 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 35" (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.



DIAGONAL BRACE
SEE SPECIAL NOTE 2 ABOVE.

TYPE "D" K-BRACE



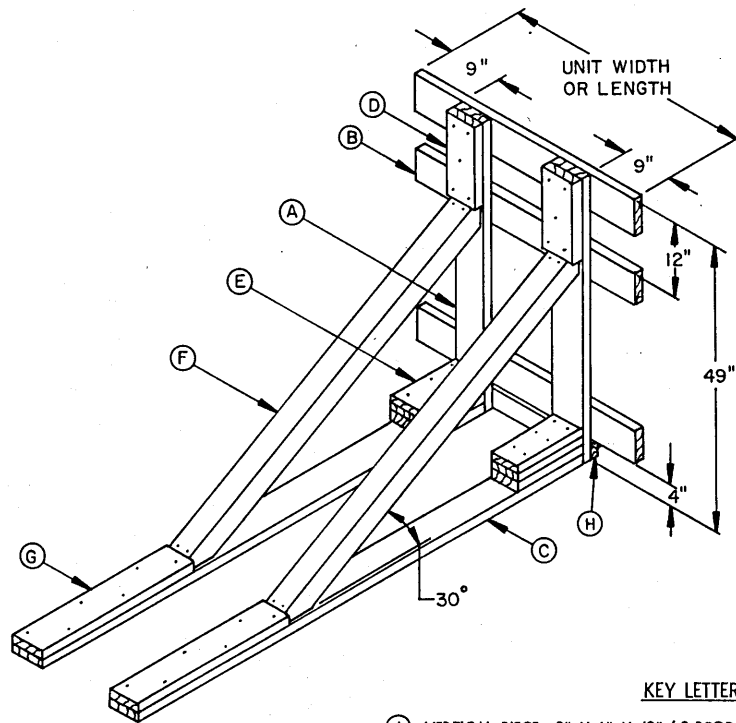
ISOMETRIC VIEW

KEY NUMBERS

SPECIAL NOTES:

1. A 9'-2" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS AND CARS HAVING METAL LININGS CAN BE USED.
2. THE LOAD SHOWN DEPICTING THE KNEE BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. THE QUANTITY MAY BE ADJUSTED TO SUIT, PROVIDED THE LIMITATIONS OF THE KNEE BRACE AS SET FORTH IN SPECIAL NOTE 3 ARE NOT EXCEEDED. ALSO, THE LOAD MAY CONSIST OF TWO LENGTHWISE ROWS, OR TWO CROSSWISE ROWS IN LIEU OF ONE OF EACH AS DEPICTED.
3. A KNEE BRACE ASSEMBLY WILL BE USED FOR EACH ROW OF UNITS. ONE (1) KNEE BRACE ASSEMBLY IS ADEQUATE FOR RETAINING A MAXIMUM LCL LOAD OF NOT MORE THAN 8,500 POUNDS.

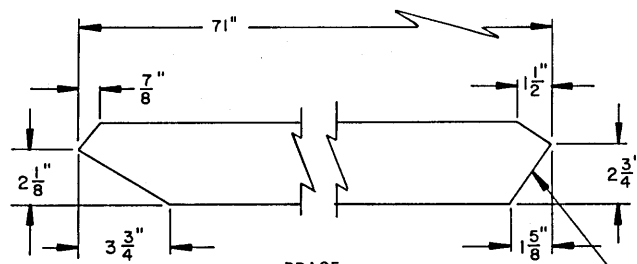
- ① CRIB FILL (2 REQD). SEE THE "CRIB FILL A" DETAIL FOR 1-HIGH LOADS ON PAGE 13. SEE GENERAL NOTE "K" ON PAGE 2.
- ② KNEE BRACE ASSEMBLY (2 REQD). SEE THE DETAIL ON PAGE 29 FOR CONSTRUCTION SPECIFICATIONS AND NAILING REQUIREMENTS.



KNEE BRACE

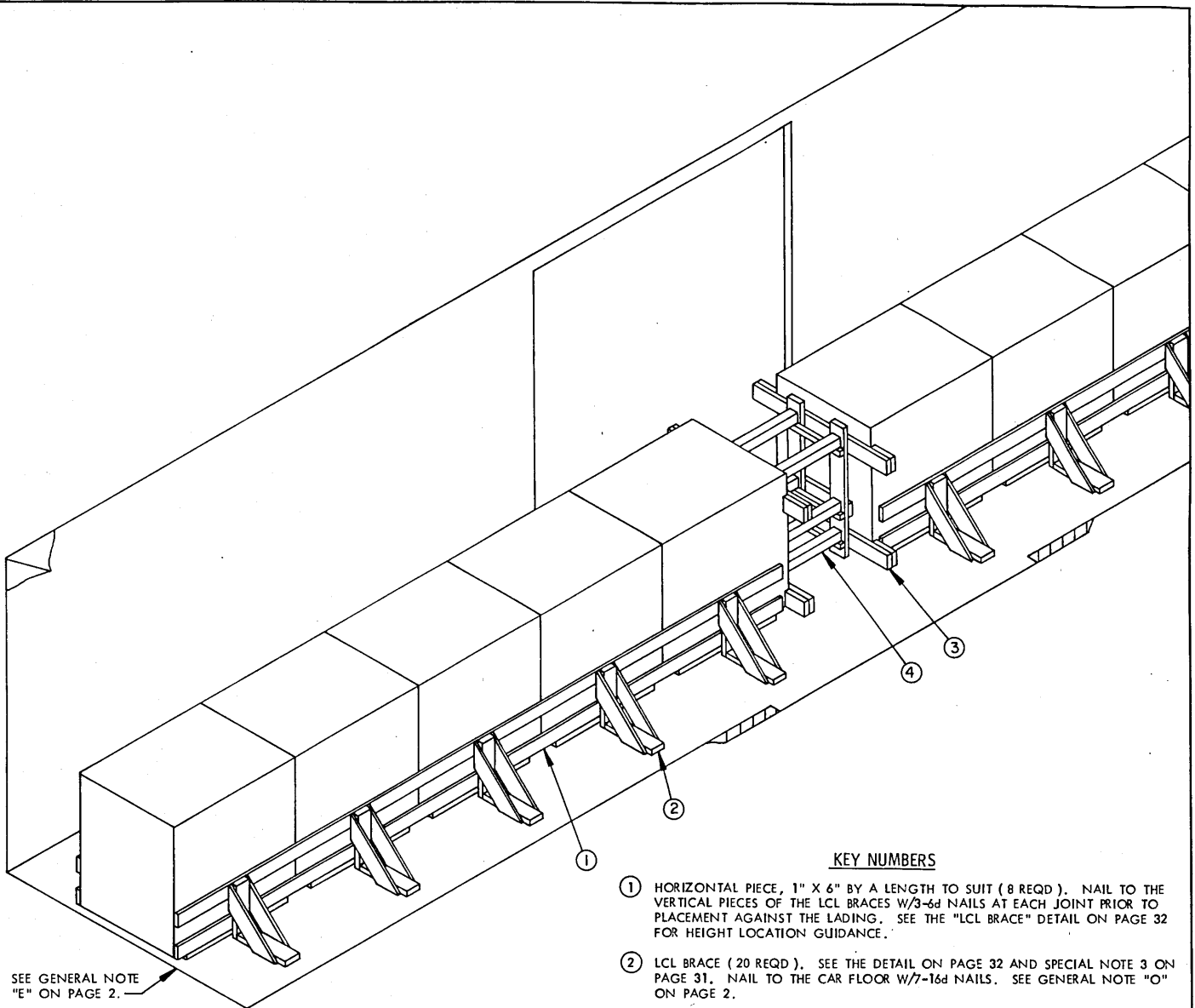
KEY LETTERS

- (A) VERTICAL PIECE, 2" X 6" X 49" (2 REQD).
- (B) HORIZONTAL PIECE, 2" X 6" BY PALLETIZED UNIT WIDTH OR LENGTH (3 REQD). NAIL TO THE VERTICAL PIECES W/3-10d NAILS AT EACH JOINT.
- (C) FLOOR CLEAT, 2" X 6" X 7'-8" (2 REQD). ALIGN WITH A VERTICAL PIECE AND NAIL TO THE CAR FLOOR W/1-16d NAIL EVERY 8".
- (D) HOLD-DOWN CLEAT, 2" X 6" X 14" (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 PIECE TO THE FIRST IN A LIKE MANNER AND TOENAIL IT TO THE VERTICAL PIECE, PIECE MARKED (A), W/2-16d NAILS. NAIL THE THIRD PIECE IN A LIKE MANNER.
- (F) BRACE, 4" X 4" X 71" (2 REQD). SEE THE DETAIL AT LEFT FOR BEVEL CUTS REQUIRED. TOENAIL TO THE VERTICAL PIECE AND TO THE FLOOR CLEAT, PIECES MARKED (A) AND (C), W/2-16d NAILS AT EACH 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" BY UNIT WIDTH OR LENGTH MINUS 18" (DOUBLED) NAIL THE FIRST PIECE TO THE VERTICAL PIECES, PIECES MARKED (A), W/2-10d NAILS AT EACH JOINT. LAMINATE THE SECOND PIECE TO THE FIRST W/4-10d NAILS.



BRACE

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

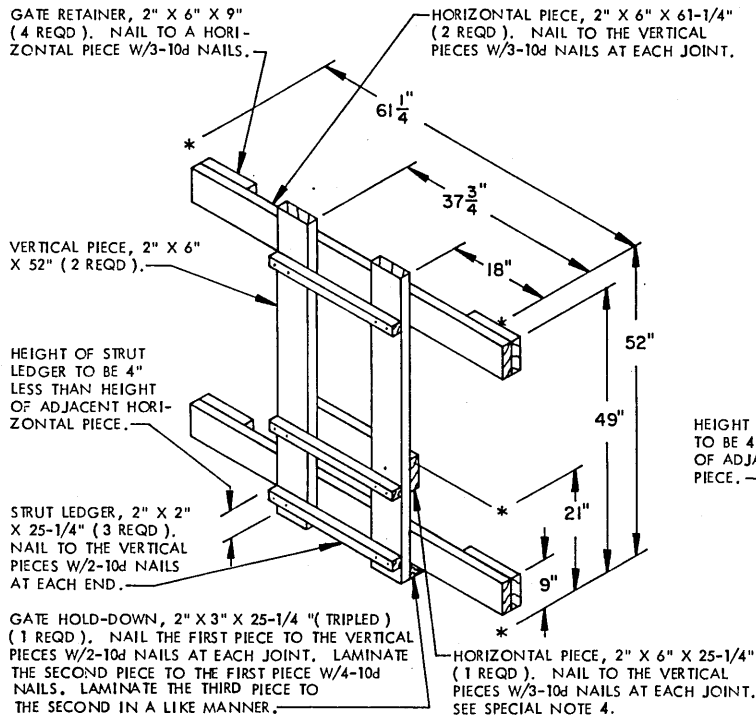


SEE GENERAL NOTE
"E" ON PAGE 2.

ISOMETRIC VIEW

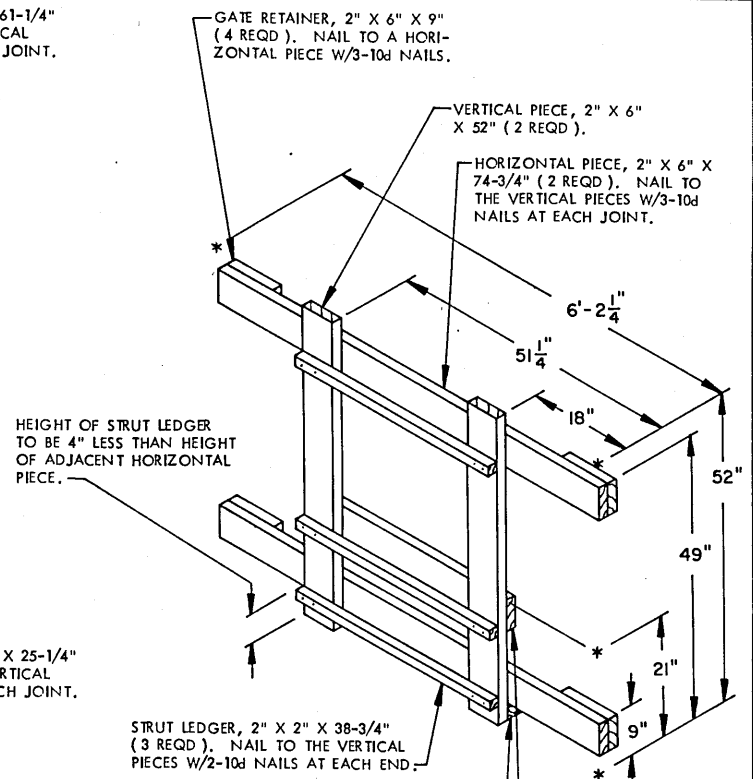
KEY NUMBERS

- 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 32 FOR HEIGHT LOCATION GUIDANCE.
- ② LCL BRACE (20 REQD). SEE THE DETAIL ON PAGE 32 AND SPECIAL NOTE 3 ON PAGE 31. NAIL TO THE CAR FLOOR W/7-16d NAILS. SEE GENERAL NOTE "O" ON PAGE 2.
- ③ CENTER GATE (2 REQD). SEE THE "CENTER GATE D" OR THE "CENTER GATE E" DETAIL ON PAGE 31 FOR LENGTHWISE OR CROSSWISE UNITS, RESPECTIVELY.
- ④ STRUT, 4" X 4" BY CUT TO FIT (REF: 33") (6 REQD). TOENAIL TO PIECES MARKED ④ W/2-16d NAILS AT EACH END. SEE GENERAL NOTES "Q" AND "R" ON PAGE 2, AND SPECIAL NOTE 4 ON PAGE 31.



CENTER GATE D

THIS GATE IS FOR USE WITH LENGTHWISE UNITS.



CENTER GATE E

THIS GATE IS FOR USE WITH CROSSWISE UNITS.

SPECIAL NOTES:

1. A 50'-6" LONG BY 9'-2" WIDE CONVENTIONAL TYPE BOXCAR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED, AND SHORTER BUT NOT LONGER CARS WILL BE USED.
2. A 1-WIDE LENGTHWISE LOAD IS SHOWN AS TYPICAL. NOTE THAT THE QUANTITY OF LCL BRACES, PIECES MARKED (2), IS NOT CORRECT FOR CROSSWISE LOADS.
3. ONE (1) LCL BRACE WILL BE USED AT EACH SIDE OF EACH UNIT. FOR CROSSWISE UNITS, THE BRACES WILL BE CENTERED ON THE LENGTH OF THE UNIT. FOR THE LENGTHWISE UNITS, THE BRACES WILL BE LOCATED NEAR THE CENTER OF THE UNIT WIDTH.
4. FOR LENGTHWISE LOADS IN 40'-6" LONG CARS, THE MIDDLE HORIZONTAL PIECE AND STRUT LEDGER WILL BE OMITTED. ONLY FOUR (4) STRUTS ARE REQUIRED. FOR CROSSWISE LOADS IN 50'-6" AND 60'-8" LONG CARS, A HORIZONTAL PIECE AT A HEIGHT OF 38" AND AN ADDITIONAL STRUT LEDGER AT A HEIGHT OF 34" ARE REQUIRED. EIGHT (8) STRUTS ARE REQUIRED FOR 50'-6" AND 60'-8" LONG CARS LOADED WITH CROSSWISE UNITS

BILL OF MATERIAL *		
LUMBER	LINEAR FEET	BOARD FEET
1" X 6"	286	143
2" X 2"	13	5
2" X 3"	13	7
2" X 6"	123	123
4" X 4"	17	22
NAILS	NO. REQD	POUNDS
6d (2")	120	3/4
8d (2-1/2")	240	2-1/2
10d (3")	96	1-1/2
16d (3-1/2")	204	4-1/2

* NOTE: BILL OF MATERIAL IS FOR THE LENGTHWISE LOAD SHOWN ON PAGE 30. THE CROSSWISE LOAD BILL OF MATERIAL WILL BE DIFFERENT.

LOAD AS SHOWN

ITEM	QUANTITY	WEIGHT (APPROX)
PALLET UNIT	10	32,030 LBS
DUNNAGE		610 LBS
TOTAL WEIGHT		32,640 LBS

HORIZONTAL PIECE, 1" X 6" X 56-3/4"
(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 43-1/4"
(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 "E" ON PAGE 2.

LCL BRACE (4 REQD). SEE THE DETAIL
BELOW. LOCATE 9" IN FROM THE EDGE
OF THE PALLET, NAIL TO THE CAR FLOOR
W/7-16d NAILS. SEE GENERAL NOTES "K"
AND "O" ON PAGE 2.

ISOMETRIC VIEW

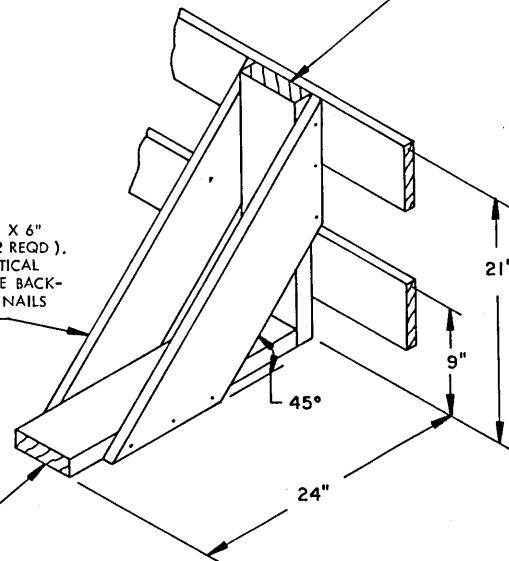
SPECIAL NOTES:

1. AN 8'-6" WIDE WOOD-LINED CONVENTIONAL TYPE BOXCAR HAVING A WOOD OR NAILABLE METAL FLOOR IS SHOWN. CARS OF OTHER WIDTHS CAN BE USED. SEE GENERAL NOTE "O" ON PAGE 2.
2. THE LOAD SHOWN DEPICTING THE LCL BRACE METHOD OF PARTIAL-LAYER BRACING IS TYPICAL. A CROSSWISE UNIT IS SHOWN. HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LENGTHWISE UNITS AND FOR OTHER QUANTITIES AS LONG AS THE CAPACITY OF THE BRACES IS NOT EXCEEDED. SEE SPECIAL NOTE 3.
3. EACH LCL BRACE AS APPLIED FOR LONGITUDINAL BRACING WILL RETAIN 2,000 POUNDS OF LADING. EACH LCL BRACE AS APPLIED FOR LATERAL BRACING WILL SUPPORT 8,000 POUNDS OF LADING. A MINIMUM OF TWO (2) BRACES MUST BE USED FOR LONGITUDINAL BRACING.

VERTICAL PIECE, 2" X 6" X 21"
(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.

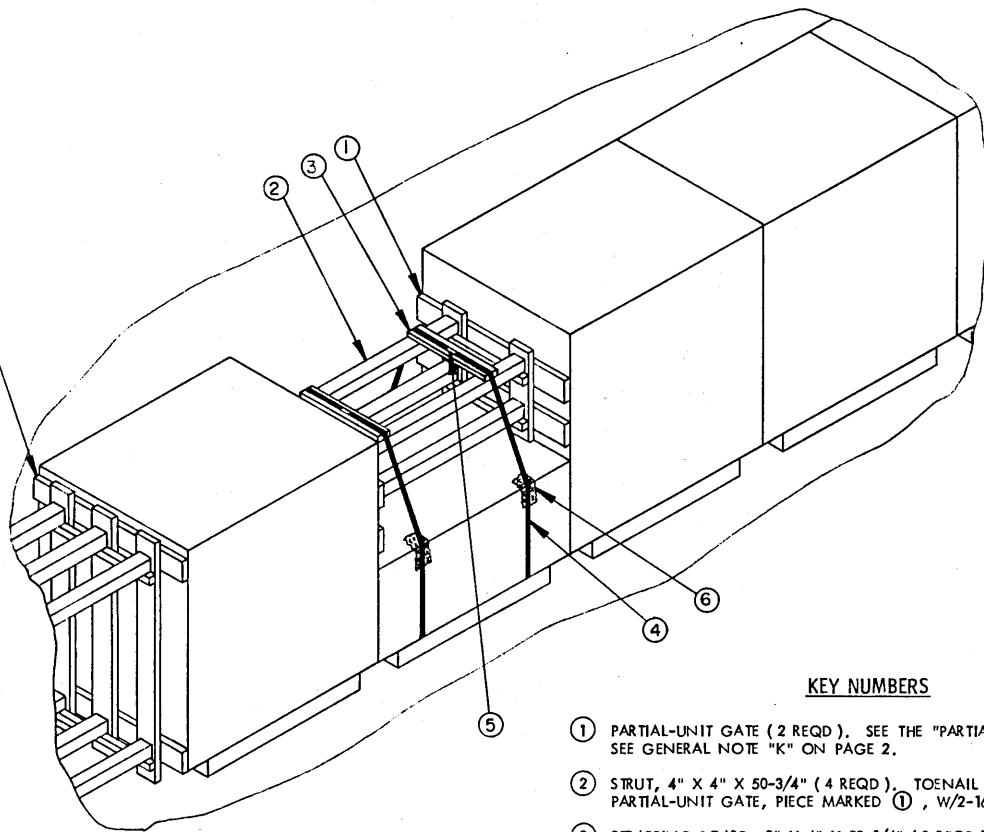
BACK-UP CLEAT,
2" X 6" X 24"
(1 REQD).



LCL BRACE

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

INDICATES A TYPICAL CENTER GATE.



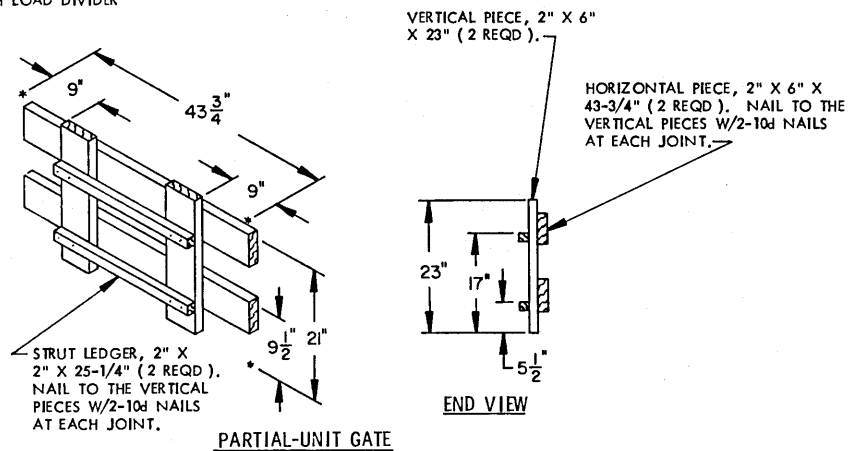
POSITIONING OF PARTIAL LENGTHWISE UNITS WITHIN A LAYER

KEY NUMBERS

- ① PARTIAL-UNIT GATE (2 REQD). SEE THE "PARTIAL-UNIT GATE" DETAIL BELOW. SEE GENERAL NOTE "K" ON PAGE 2.
- ② STRUT, 4" X 4" X 50-3/4" (4 REQD). TOENAIL TO THE VERTICAL PIECES OF THE PARTIAL-UNIT GATE, PIECE MARKED ①, W/2-16d NAILS AT EACH END.
- ③ STRAPPING BOARD, 2" X 4" X 23-1/4" (2 REQD). NAIL TO THE STRUTS, PIECES MARKED ②, W/3-10d NAILS AT EACH END.
- ④ UNITIZING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (2 REQD). PRE-POSITION THRU THE FORKLIFT OPENINGS OF THE UNIT.
- ⑤ SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 2 PER JOINT). SEE GENERAL NOTE "L" ON PAGE 2 AND STRAP JOINT DETAIL ON PAGE 43.
- ⑥ ANTI-CHAFING NEUTRAL BARRIER MATERIAL. POSITION BETWEEN CONTAINERS AND STRAPPING AT POINTS OF CONTACT.

SPECIAL NOTES:

1. SHIPMENTS OF 40MM CARTRIDGES 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 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF A PARTIAL UNIT WITHIN A LOAD.
2. THE "POSITIONING OF PARTIAL LENGTHWISE UNIT WITHIN A LAYER" VIEW ABOVE DEPICTS A PORTION OF A CONVENTIONAL BOXCAR LOAD, HOWEVER, THE PROCEDURES ARE ALSO APPLICABLE FOR LOADS IN CARS EQUIPPED WITH LOAD DIVIDER BULKHEADS.



PARTIAL-UNIT GATE

END VIEW

VERTICAL UNITIZING STRAP, 1-1/4" X .035" OR .031" BY 17'-0" LONG STEEL STRAPPING (2 REQD.).

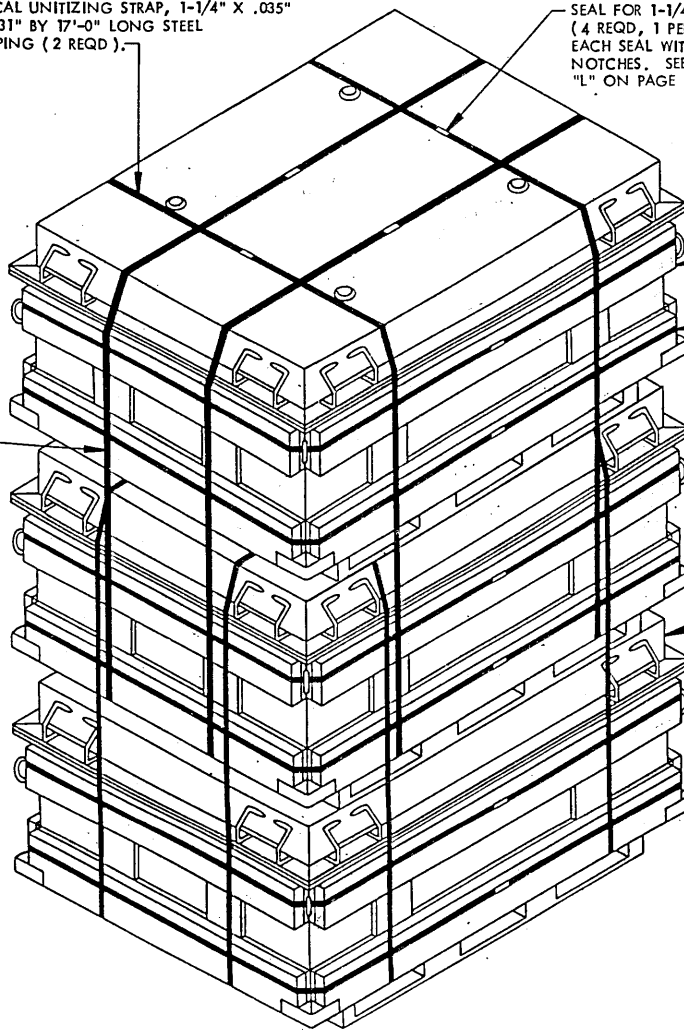
SEAL FOR 1-1/4" STEEL STRAPPING (4 REQD, 1 PER STRAP). CRIMP EACH SEAL WITH TWO PAIR OF NOTCHES. SEE GENERAL NOTE "L" ON PAGE 2.

VERTICAL UNITIZING STRAP, 1-1/4" X .035" OR .031" BY 19'-3" LONG STEEL STRAPPING (2 REQD.).

INDICATES A TYPICAL HALF-HEIGHT UNIT.

SEE SPECIAL NOTE 3.

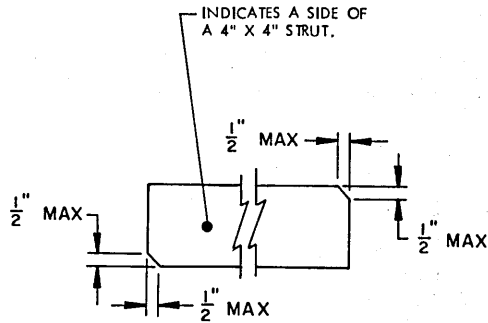
INDICATES A TYPICAL FULL HEIGHT UNIT AS SHOWN ON PAGE 43.



SECUREMENT OF A PARTIAL UNIT ON TOP OF A FULL UNIT

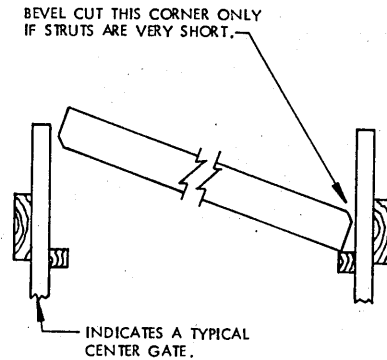
SPECIAL NOTES:

1. THE VIEW SHOWN ABOVE DEPICTS A PARTIAL UNIT POSITIONED ON TOP OF A FULL-HEIGHT UNIT AND UNITIZED WITH FOUR VERTICAL AND TWO HORIZONTAL UNITIZING STRAPS. PLACEMENT WITHIN THE LOAD IS OPTIONAL.
2. SHIPMENT OF 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 33 ARE PRESENTED AS GUIDANCE IN THE SHIPMENT OF THESE PARTIAL UNITS.
3. FOR PARTIAL UNIT DUNNAGE, REFER TO U.S. ARMY AMC DRAWING 19-48-4186-20PM1005. USE TWO END BLOCKING ASSEMBLIES, TWO SIDE BLOCKING ASSEMBLIES, AND TWO HORIZONTAL STRAPS.



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")

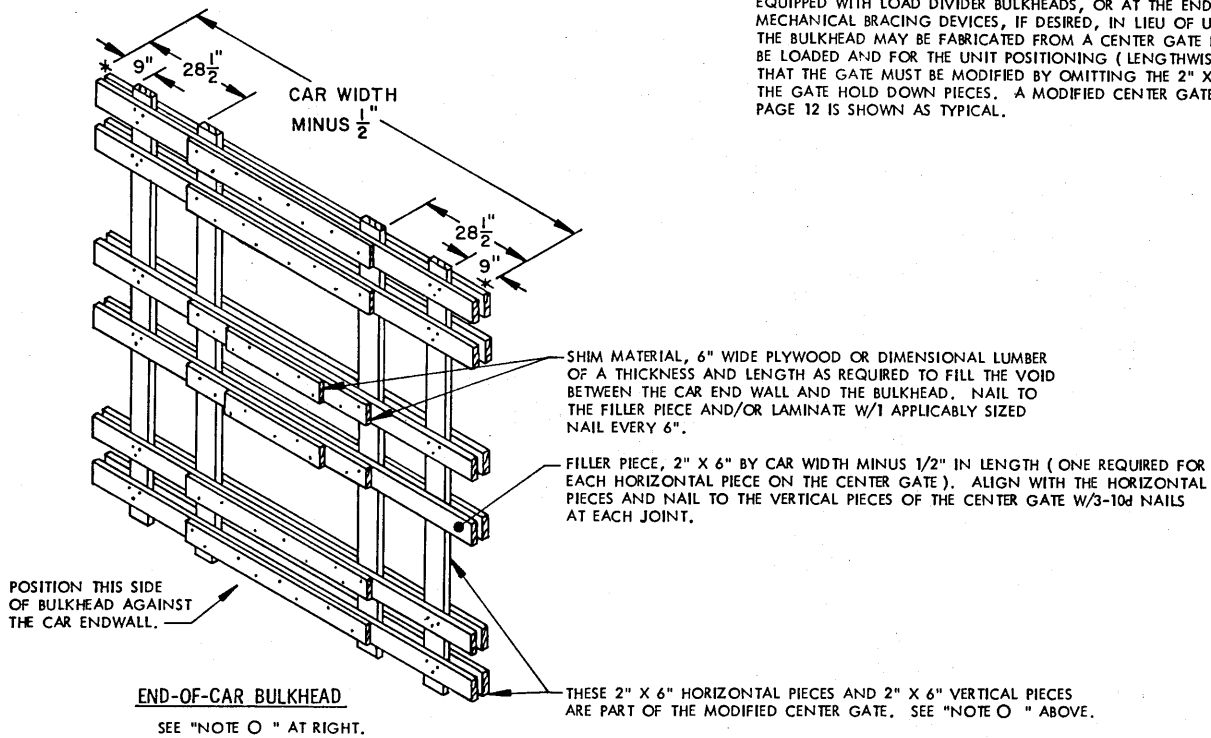


STRUT INSTALLATION

SEE GENERAL NOTE "R" ON PAGE 2 FOR ADDITIONAL STRUT INSTALLATION GUIDANCE.

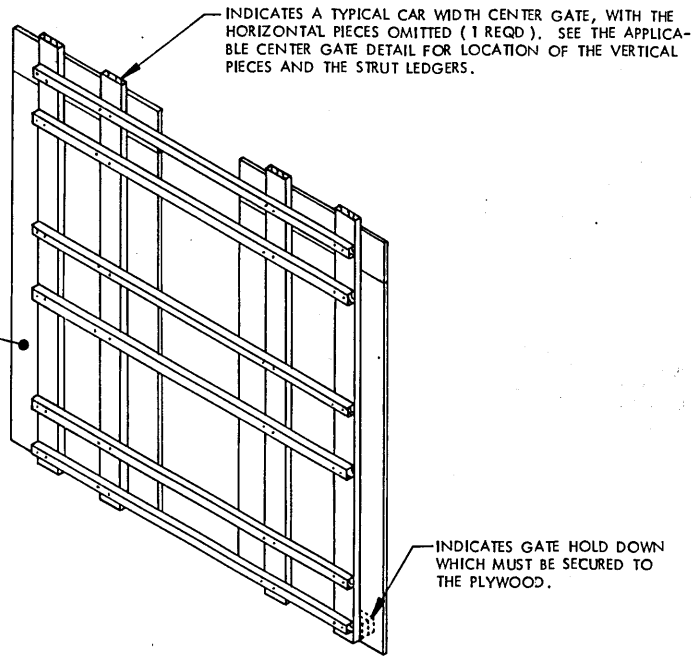
NOTE O :

IF A BOXCAR TO BE LOADED HAS BOWED ENDWALLS 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 BOXCAR OR IN A CAR EQUIPPED WITH LOAD DIVIDER BULKHEADS, OR AT THE END OF A CAR EQUIPPED WITH MECHANICAL BRACING DEVICES, IF DESIRED, IN LIEU OF USING CROSS MEMBERS. THE BULKHEAD MAY BE FABRICATED FROM A CENTER GATE FOR THE UNIT THAT IS TO BE LOADED AND FOR THE UNIT POSITIONING (LENGTHWISE OR CROSSWISE). NOTE THAT THE GATE MUST BE MODIFIED BY OMITTING THE 2" X 2" STRUT LEDGERS AND THE GATE HOLD DOWN PIECES. A MODIFIED CENTER GATE "A" AS DETAILED ON PAGE 12 IS SHOWN AS TYPICAL.



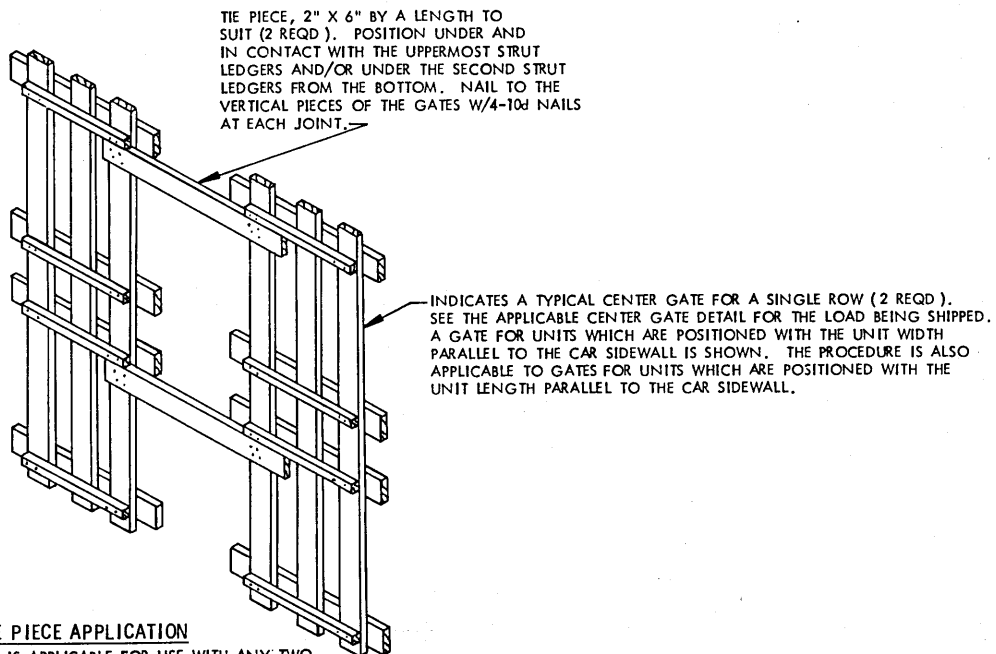
END-OF-CAR BULKHEAD
SEE "NOTE O " AT RIGHT.

PLYWOOD, 1/2" THICK BY THE UNIT WIDTH OR LENGTH BY THE LOAD HEIGHT (2 REQD). NAIL TO THE VERTICAL PIECES W/1-6d NAIL EVERY 6".
 NOTE: THE WIDTH OF THE PLYWOOD WILL BE UNIT WIDTH IF THE LENGTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 6. OR UNIT LENGTH IF THE WIDTH OF THE UNIT IS PARALLEL WITH THE SIDEWALL OF A CAR, AS TYPICALLY SHOWN IN THE LOAD ON PAGE 4. PLYWOOD MAY BE ALLOWED TO EXTEND BEYOND THE UNIT LENGTH OR WIDTH, IF DESIRED.



PLYWOOD CENTER GATE ALTERNATIVE

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

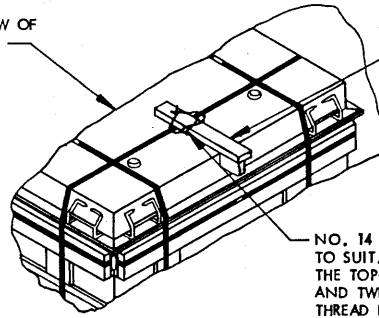


TIE PIECE APPLICATION

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

PARTIAL VIEW OF UNIT.

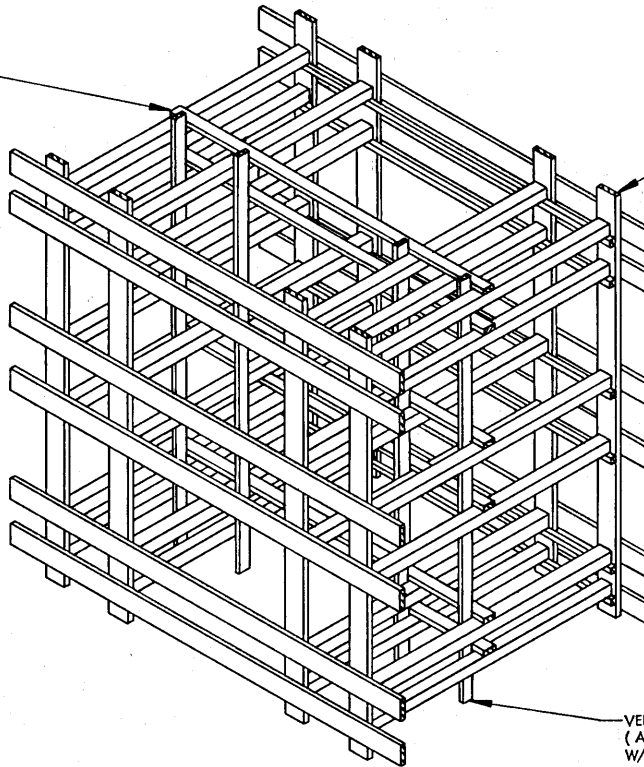
TOP-OF-LOAD ANTI-SWAY BRACE.



NO. 14 GAGE WIRE BY A LENGTH TO SUIT. FORM TWO LOOPS AROUND THE TOP-OF-LOAD ANTI-SWAY BRACE AND TWIST TO PREVENT DISLODGE-
MENT. THREAD EACH END OF THE WIRE UNDER THE LOAD STRAP AND TWIST WIRE TO SELF AS SHOWN.

TIE WIRE APPLICATION

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

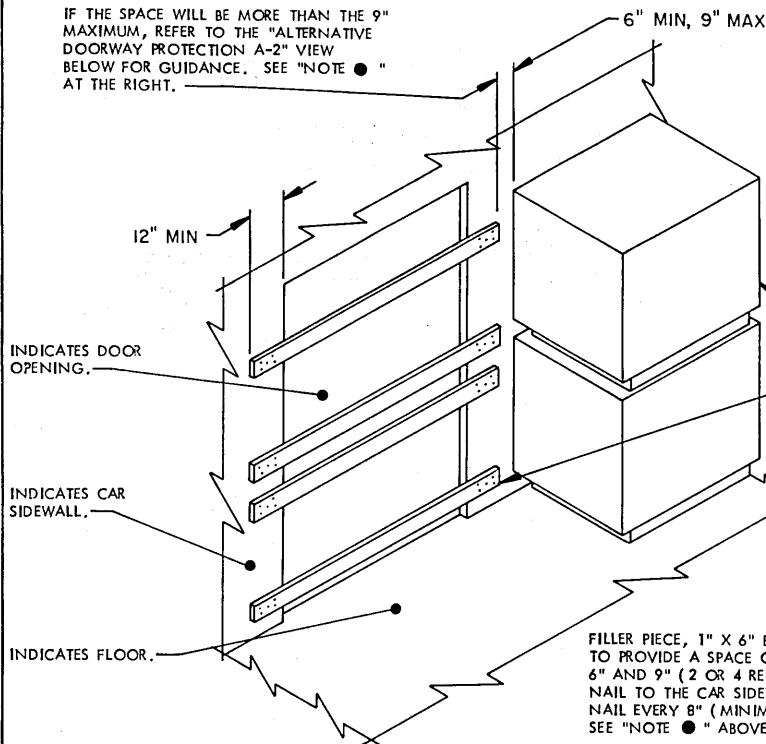


A CENTER GATE FOR A 2-LAYER LOAD OF CROSSWISE POSITIONED UNITS IS SHOWN AS TYPICAL.

VERTICAL PIECE, 2" X 4" X 9'-0" (AS REQD.). NAIL TO THE STRUTS W/3-10d NAILS AT EACH JOINT.

TYPICAL STRUT BRACING
SEE GENERAL NOTE "Q" ON PAGE 2.

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.

INDICATES A UNIT LOAD.

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

SEE "NOTE ●" ABOVE.

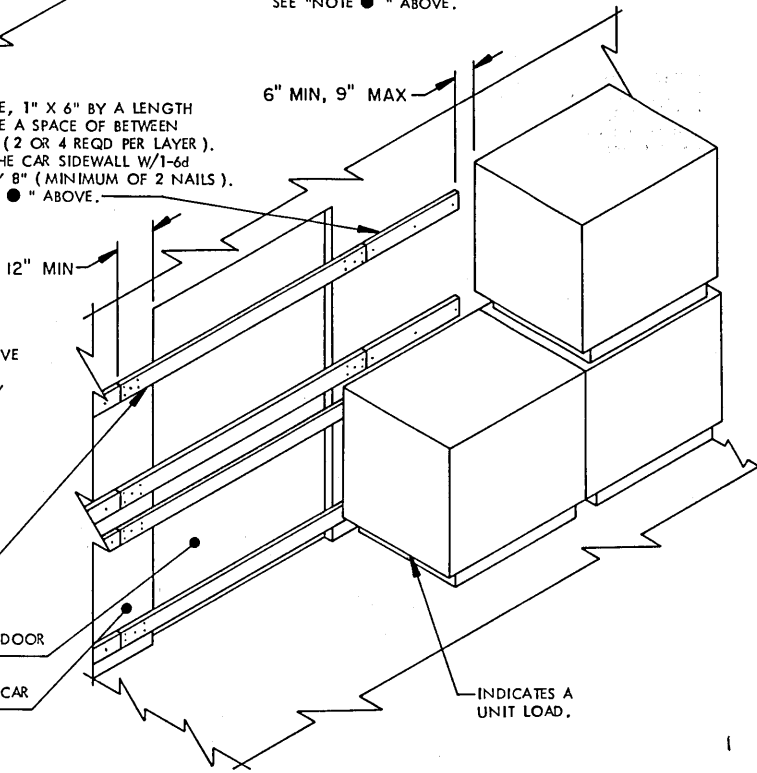
FILLER PIECE, 1" X 6" BY A LENGTH TO PROVIDE A SPACE OF BETWEEN 6" AND 9" (2 OR 4 REQD PER LAYER). NAIL TO THE CAR SIDEWALL W/1-6d NAIL EVERY 8" (MINIMUM OF 2 NAILS). SEE "NOTE ●" ABOVE.

ALTERNATIVE DOORWAY PROTECTION A-1

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. THE METHOD CAN ALSO BE USED IN CARS EQUIPPED WITH PLUG DOORS; HOWEVER, A METHOD OTHER THAN THE "ALTERNATIVE DOORWAY PROTECTION A-3" PROCEDURES BELOW MUST BE USED ON THE LOADING SIDE OF THE CAR, SUCH AS THE "ALTERNATIVE DOORWAY PROTECTION C" PROCEDURES ON PAGE 39 OR THE NAILED-DOWN BLOCKING AND STEEL STRAPPING METHOD DEPICTED BY THE "ALTERNATIVE DOORWAY PROTECTION E" AND "ALTERNATIVE DOORWAY PROTECTION F" DETAILS ON PAGE 40.

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

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

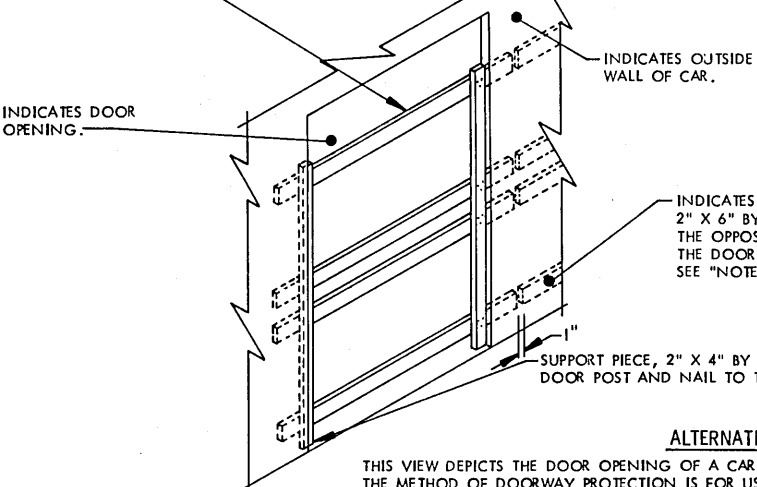


ALTERNATIVE DOORWAY PROTECTION A-2

THIS METHOD OF DOORWAY PROTECTION IS FOR USE IN CARS HAVING NAILABLE SIDEWALLS AND EQUIPPED WITH CONVENTIONAL SLIDING DOORS, AND IS APPLICABLE ONLY FOR THE SIDE OPPOSITE THE LOADING SIDE OF THE CAR. SEE THE NOTE UNDER THE "A-1" PROCEDURES.

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

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



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 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.

INDICATES DOOR OPENING.

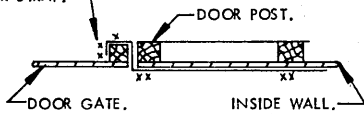
VIEW B

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

INDICATES CAR SIDEWALL.

DOORWAY PROTECTION-GATE STRAP, 1-1/4" X .035" X 36" (REF) NAIL-ON TYPE STEEL STRAPPING (4 REQD PER LAYER OF LOAD). NAIL TO GATE AND CAR SIDEWALL AS SHOWN BY THE "VIEW B" SKETCH BELOW. NOTE THAT TYPE 1 STRAPPING MAY BE PUNCHED FOR NAILING IF TYPE 2 STRAPPING IS NOT AVAILABLE.

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



VIEW B

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

ALTERNATIVE DOORWAY PROTECTION B

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

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

INDICATES DOOR OPENING.

INDICATES CAR SIDEWALL.

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

VIEW A

INDICATES STRAP ANCHOR PLATE.

DOOR SPANNER END OF STRAP.

ISOMETRIC VIEW

VIEW A

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

8'-7"

63"

46"

7"

INDICATES FLOOR.

A TOLERANCE OF PLUS OR MINUS 2" IS PERMISSIBLE.

DOORWAY PROTECTION

PAGE 39

PROJECT CA 229-85

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

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

DOOR OPENING WIDTH

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

STRAPPING BOARD, 2" X 6" BY LOAD WIDTH (1 REQD). NAIL TO 2" X 4" FILLER CLEAT W/3-10d NAILS AT EACH END.

FILLER CLEAT, 2" X 4" (RIPPED TO 2-1/4") X 12" (2 REQD).

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

STRAPPING BOARD

BUNDLING STRAP, 1-1/4" X .035" OR .031" BY A LENGTH TO SUIT STEEL STRAPPING (AS REQD). STAPLE TO STRAPPING BOARD W/3 STAPLES. SEE "NOTE *" BELOW.

STRAPPING BOARD (AS REQD). SEE THE DETAIL ABOVE.

SPREADER PIECE, 2" X 3" MATERIAL CUT SLIGHTLY LONGER THAN MEASURED DISTANCE (2 REQD). DRIVE INTO POSITION TO PROVIDE FOR A WEDGE FIT. TOE-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 AVAILABLE. IF THE CAR HAS AVAILABLE SIDEWALLS, NAIL-ON TYPE STRAPPING MAY BE USED TO SECURE THE GATE IN LIEU OF USING THE SPREADER PIECES. SEE THE "ALTERNATIVE DOORWAY PROTECTION B" DETAIL ON PAGE 39 FOR GUIDANCE.

DOOR OPENING.

SPACER ASSEMBLY (AS REQD). SEE THE DETAIL AT RIGHT.

SIDE BLOCKING, 2" X 6" X 43" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING 1 OR 2 BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. OMIT ANTI-SWAY BRACE (S) AT FLOOR LEVEL.

INDICATES DOOR OPENING.

ALTERNATIVE DOORWAY PROTECTION E

STRAPPING BOARD, 2" X 6" BY CAR WIDTH MINUS 11" (1 REQD). NAIL TO 2" X 6" X 12" W/2-12d NAILS AT EACH JOINT.

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

FABRICATE TO FIT

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

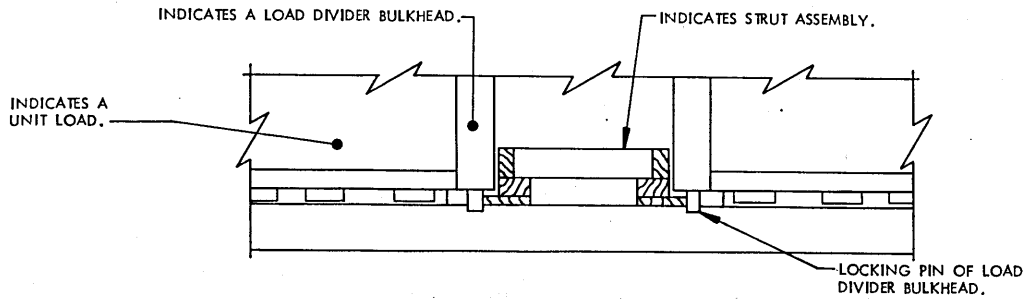
BUNDLING STRAP, 1-1/4" X .031" OR .035" BY A LENGTH TO SUIT STEEL STRAPPING (AS REQD). STAPLE TO SPACER ASSEMBLY W/3 STAPLES. SEE "NOTE *" BELOW.

SPACER ASSEMBLY

SIDE BLOCKING, 2" X 6" X 48" (DOUBLED) (2 REQD FOR EACH LOAD UNIT REQUIRING 1 OR 2 BUNDLING STRAPS). NAIL THE FIRST PIECE TO THE CAR FLOOR W/5-16d NAILS. NAIL THE SECOND PIECE TO THE FIRST IN A LIKE MANNER. OMIT ANTI-SWAY BRACE (S) AT FLOOR LEVEL.

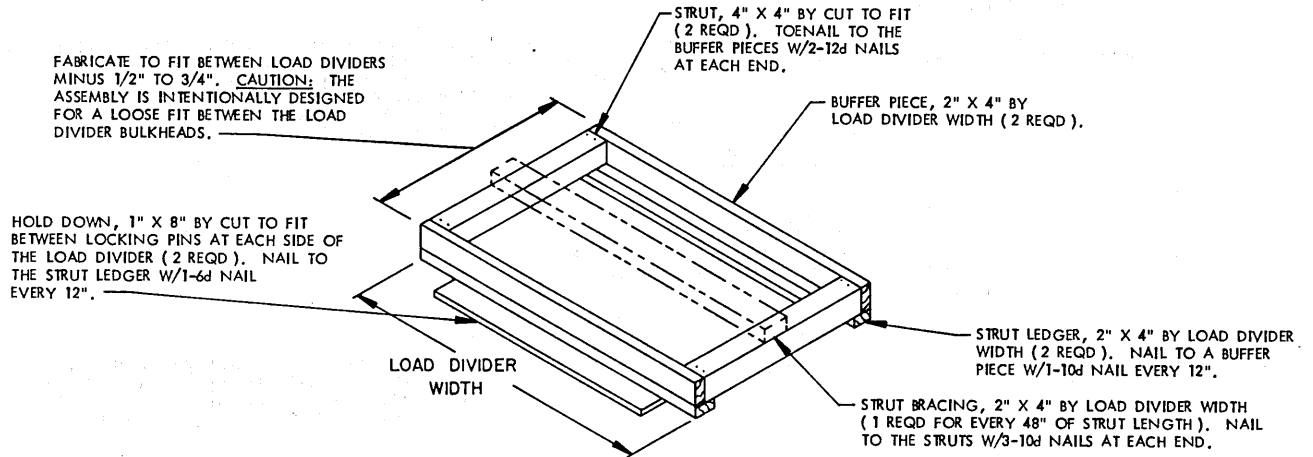
ALTERNATIVE DOORWAY PROTECTION F

NOTE *: TWO (2) BUNDLING STRAPS ARE REQUIRED FOR EACH PALLET STACK AND/OR LOAD UNIT WHICH IS COMPLETELY WITHIN THE DOORWAY AREA OR WHICH IS NOT RETAINED BY AT LEAST SIX INCHES (6") OF CAR 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 6" TO ONE-HALF THE PALLET/LOAD UNIT LENGTH OR WIDTH.



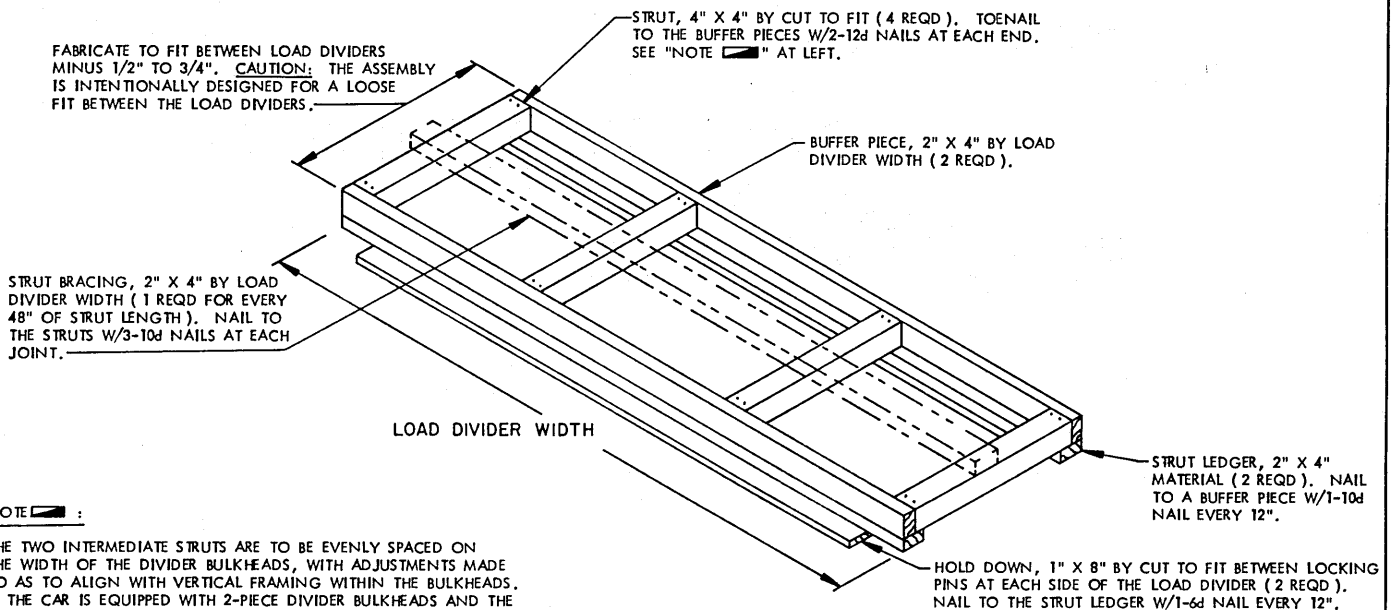
INSTALLATION OF STRUT ASSEMBLY

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

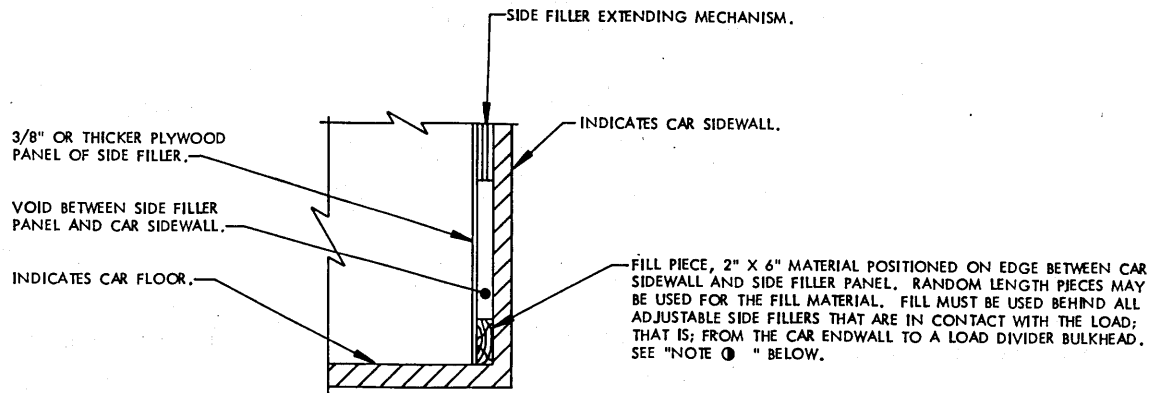


NOTE:

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 CLASS A OR CLASS B EXPLOSIVES. A STRUT ASSEMBLY IS NOT REQUIRED FOR LOADS OF CLASS C EXPLOSIVES, REGARDLESS OF THE WEIGHT OF THE LOAD.

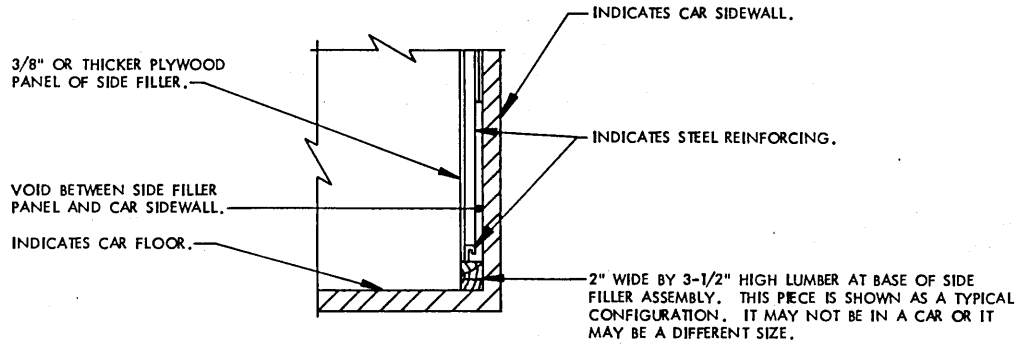


TYPICAL TYPE A

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

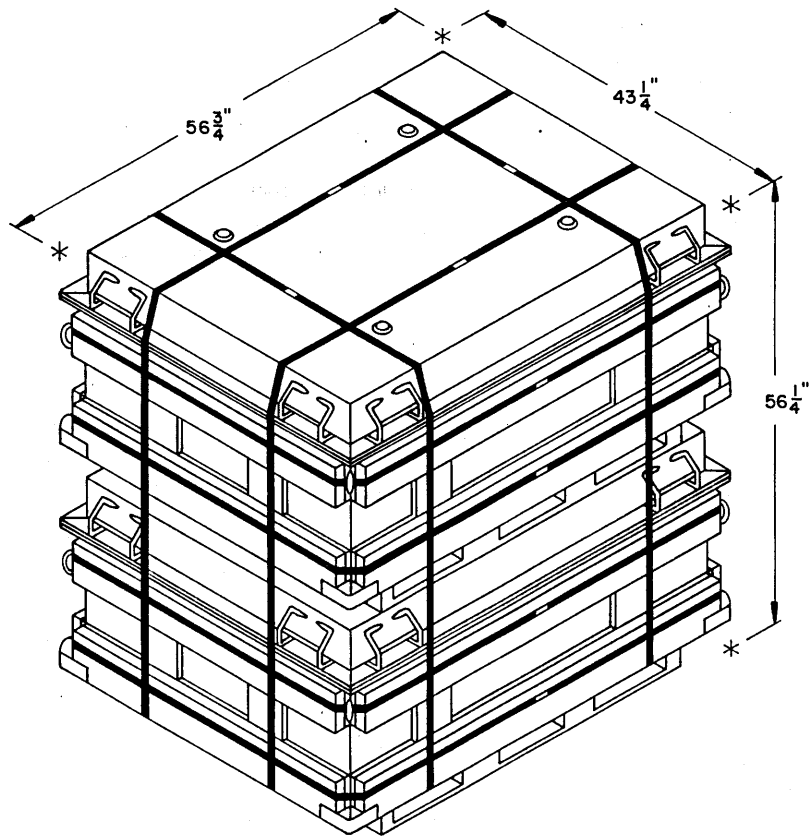
NOTE ①:

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



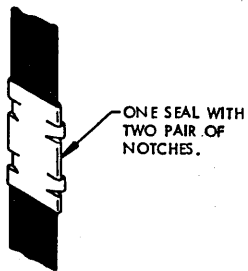
TYPICAL TYPE B

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



UNIT LOAD

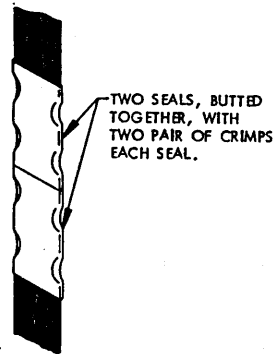
CONTAINER ----- 2 EACH @ 1,500 LBS (APPROX)
 CUBE ----- 79.9 CUBIC FEET (APPROX)
 GROSS WEIGHT ----- 3,203 LBS (APPROX)



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.

